SEPTEMBER, 1918

International Abstract of Surgery

SUPPLEMENTARY TO

Surgery, Gynecology and Obstetrics

PUBLISHED IN COLLABORATION WITH

Journal de Chirurgie, Paris

Zentralblatt fuer die gesamte Chirurgie und ihre Grenzgebiete, Berlin

Zentralblatt fuer die gesamte Gynaekologie und Geburtshilfe sowie deren Grenzgebiete, Berlin

EDITORS

FRANKLIN H. MARTIN, Chicago
PAUL LECÈNE, Paris
SIR BERKELEY MOYNIHAN, C.B., Leeds
AUGUST BIER, Berlin

CAREY CULBERTSON, Abstract Editor

INTERNATIONAL SECRETARIES

CARL BECK, Chicago
J. DUMONT, Paris
EUGENE JOSEPH, Berlin

CONSULTING EDITORIAL STAFF

GENERAL SURGERY

AMERICA: E. Wyllys Andrews Willard Bartlett Frederic A. Besley Arthur Dean Bevan J. F. Binnie George E. Brewer W. B. Brinsmade John Young Brown David Cheever H. R. Chislett Robert C. Coffey F. Gregory Connell Frederic J. Cotton George W. Crile W. R. Cubbins Harvey Cushing J. Chalmers DaCosta Charles Davison D. N. Eisendrath J. M. T. Finney Jacob Frank Charles H. Frazier Emanuel Friend William Fuller John H. Gibbon D. W. Graham W. W. Grant A. E. Halstead M. L. Harris A. P. Heineck William Hessert Thomas W. Huntington Jabez N.

(Editorial Staff continued on pages ix, x and xi)

Editorial communications should be sent to Franklin H. Martin, Editor, 30 N. Michigan Ave., Chicago
Editorial and Business Offices: 30 N. Michigan Ave., Chicago, Illinois, U. S. A.
Publishers for Great Britain: Bailliere, Tindall & Cox, 8 Henrietta St., Covent Garden, London, W. C.

TABLE OF CONTENTS

I. INDEX OF ABSTRACTS OF CURRENT LITERATURE iii
II. AUTHORS xii
III. COLLECTIVE REVIEW: GAS GANGRENE. *Abraham O. Wilensky, M.D., New York.* 187–195
IV. ABSTRACTS OF CURRENT LITERATURE 196–270
V. BIBLIOGRAPHY OF CURRENT LITERATURE 271–286

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

Operative Surgery and Technique

FIOLLE, J., and DELMAS, J.: Exposure of Deep Vessels by Wide Routes of Access 196
CANNON, W. B., FRASER, J., and COWELL, E. M.: The Preventive Treatment of Wound Shock 199

Aseptic and Antiseptic Surgery

FIESSINGER, N., and CLOGNE, R.: Biological Study of the Action of Alkaline Hypochlorites in the Treatment of War Wounds 201
TAYLOR, W. H., and TAYLOR, N. B.: Liquid-Tight Closure and the Treatment of Wounds 201
PHOCAS: Early and Total Discontinuance of Dressings in Surgical Wounds 202
MORISON, A. E. : Incarcerated Sepsis 202

Anæsthetics

GWATHMEY, J. T., and KARSNER, H. T.: General Analgesia by Oral Administration 203
PALMER, C. B.: Obstetrical Anæsthesia 255

Surgical Instruments and Apparatus

PEARSON, W.: Splints for Use in Arm, Ankle, and Leg Injuries, with Some Observations on Treatment 203
CRILE, D. W.: An Abduction Splint for the Femur .. 203

SURGERY OF THE HEAD AND NECK

Head

SPEED, K.: Gunshots of the Head, with Especial Reference to Indications for Operation and Technique; Demonstration of Cases 204
JANEWAY, H. H.: Treatment of Cancer of the Lip by Radium; a Report of 24 Cases 205
GATEWOOD, L.: Radical Surgery of the Maxillary Antrum with Conductive or Perineural Anæsthesia 205
JUDD, E. S., NEW, G. B., and MANN, F. C.: The Effect of Trauma upon the Laryngeal Nerves ... 205
SHARPE, W.: Fractures of the Skull; the Resulting Intracranial Pathology and the Treatment 206
WALTHAL, D. O.: Recovery of a Case of Purulent Meningitis Complicating Mastoiditis 207
GRAY, H. M. W.: Treatment of War Wounds of the Brain and Its Coverings at Casualty Clearing Stations 207
CUSHING, H.: Study of a Series of Wounds Involving the Brain and Its Enveloping Structures 209
SALMON, A.: Oculocerebellar Syndrome and Alternating Hemiparesis Due to a Tumor of the Posterior Quadrigeminal Eminence 213

Neck

DOWD, C. N.: Indications for Removal of Enlarged Cervical Lymph-Nodes 213

SURGERY OF THE CHEST

Chest Wall and Breast

BOGGS, R. H.: The Treatment of Carcinoma of the Breast by the Roentgen Ray 214
EASTMAN, J. R.: Hæmothorax in Gunshot Wounds .. 214
PIERSON, P. H.: Spontaneous Pneumothorax 214
MORELLI, E.: The Treatment of Empyema 215
HOLMGREN, I.: The Treatment of Tuberculous Empyema 215

Heart and Vascular System

COSTANTINI, H., and Vigot, M.: Immediate Operation in War Wounds of the Heart 216
GUILLERMO, M. L.,and Montoya, J. M.: Suppurative Pericarditis and Pericardotomy 217

SURGERY OF THE ABDOMEN

Abdominal Wall and Peritoneum

GEORGE, A. W., LEONARD, R. D., and O'BRIEN, F. W.: The Roentgen Diagnosis of Disease of the Upper Right Abdominal Quadrant 217
SYMS, P.: Pneumococcus Peritonitis 217
THUN, H. VON: Sliding Hernia 218

HOTCHKISS, L. W.: Observations on the Treatment of Direct Inguinal Hernia in Adults 218
RAYNER, H. H.: Reduction en Masse of a Strangulated Direct Inguinal Hernia 219
STAPELMOHR, S. VON: Primary Sarcoma in the Omentum Majus 219
CHUECO, A.: Large Mesenteric Cyst Removed by the Vaginal Route 220
CHARLES, R.: Gunshot Wounds of the Abdomen at a Casualty Clearing Station 246

Gastro-Intestinal Tract

JONES, N. W.: Achylia Gastrica and Chronic Connective Tissue Lientery; a Clinical Study of 322 Cases 220
FINOCHIETTO, R.: Precolic Gastro-Intestinal Anastomosis 221
KERR, N.: Triple Wounds of the Stomach from a Single Intact Bullet 221
PYBUS, F. C.: Acute Intestinal Obstruction Due to Jackson's Membrane 221
WRIGHT, J. S.: Rupture of the Intestines by Blows upon the Abdomen 221
MCDONALD, A. L.: Meckel's Diverticulum as a Cause of Surgical Lesions 222
PINKHAM, E. W.: Ileus Following Gynecological Laparotomies 222
LAPLACE, E.: The Interrelation of Appendicitis, Cholecystitis, and Pancreatitis 222
DESMARET: Enucleation of Rectal Cancers by the Coccygo-Perineal Route 223
EDWARDS, F. S.: Fistula in Ano; Why Is Operative Interference so Often Ineffectual? 224

Liver, Pancreas, and Spleen

MAYO, W. J.: The Surgical Treatment of the Cirrhoses of the Liver and Their Complications 224
FISCHER, I. F.: Examination of Gall-Stones by Roentgen Rays 225
JUDD, E. S.: The Recurrence of Symptoms Following Operations on the Biliary Tract 226
SCALONE, I.: Splenectomy for Necrotic Spleen After Gunshot 226
ELLIOTT, C. A.: Radium Treatment of Leukæmia 226
DE LANGE, C., and SCHIPPERS, J. C.: Familial Splenomegaly; a Clinical Study 227

Miscellaneous

HEYD, C. G.: The Differential Diagnosis of Affections of the Right Upper Quadrant 227
HUSSEY, F. V.: Review of 100 Consecutive Cases of Acute Diseases of the Appendix, Gall-Bladder, Duodenal and Gastric Ulcers Which Have Come to Operation 228
SAINT, C. F. M.: Abdominal Operations at an Advanced Operating Center 228
RICHARDS, O.: The Selection of Abdominal Cases for Operation 229

SURGERY OF THE EXTREMITIES

Diseases of the Bones, Joints, Etc.

EARL, G.: Bursæ 230
KIRMISSON, E.: Scapular Osteomyelitis 230
RAMEY, R. L.: Report of a Case of Osteitis Fibrosa Cysticus, Involving the Shaft of the Right Femur and Right Tibia 231
WOBUS, R. E., and OPIE, E. L.: Elephantiasis; Report of a Case 231
WILLEMS, C.: Immediate Active Mobilization as a General Method in Articular Lesions 231

Fractures and Dislocations

SIMPSON, J. A.: Traumatic Luxation of the Sacro-Iliac Symphysis, Without Fracture of the Pelvis. 232
COUTEAUD: Prognosis of Gunshot Fractures of the Thigh 232
HALL-EDWARDS, J.: Fracture of the Sesamoid Bones. 232
ROUVILLOIS, H., and GUILLAUME-LOUIS: The Treatment of War Fractures 232
FERGUSON, R. S.: Incomplete Outward Dislocation of the Knee 233

Surgery of the Bones, Joints, Etc.

MAYO-ROBSON, A. W.: Conservative Surgery of the Hand as Illustrated by a Case of Tendon Grafting 233
BABCOCK, W. W.: Interilio-Abdominal Amputation; a Description of a New Method, with Report of Three Cases 233
MOUCHET, A., and PAMART: The End-Results of Arthrotomy of the Knee 234
COFIELD, R. B.: Treatment of Septic Arthritis 234
GAUDIANI, V.: Kineplastic Amputations 235

Orthopedics in General

CAMPBELL, W. C.: Operative Measures in Infantile Paralysis 235
GOTTLIEB, A.: Prevention and Treatment of Localized Muscular Contractures 235
SMITH, E. H.: Arch Defects of the Human Foot 235
MAYER, L.: The Treatment of Flat-Feet 235

SURGERY OF THE SPINAL COLUMN AND CORD

COUTEAUD: Spinal Injuries of War 236
HASSIN, G. B., and CARROLL, E. P.: Sacral Tabes with the Clinical Picture of a Lesion of the Conus Medullaris; Report of a Case 236
HUGHES, D. M.: Laminectomy of Gunshot Wound; with a Record of Three Successful Cases 236

SURGERY OF THE NERVOUS SYSTEM

DELAGENIÈRE, H.: Surgical Treatment of Nerve Wounds; Operative Technique and Results of 245 Cases of Suture and 113 Liberations 237
YOUNG, J. K.: Gunshot Wound of the Posterior Cord of the Brachial Plexus 238

MISCELLANEOUS

Clinical Entities—Tumors, Ulcers, Abscesses, Etc.

RIBAS Y RIBAS, E.: The Treatment of Cancer..... 238
MASSON, P.: Botryomycotic Gunshot Wound..... 239
BAYLISS, W. M.: Intravenous Injection in Wound Shock..... 239
DELAUNAY, H.: Intravenous Injection of Locke's Serum with Gum Arabic in the Treatment of Severe Hæmorrhagic Hypotension and Shock ... 240
MOTTRAM, J. C., and RUSS, S.: A Contribution to the Study of Dosage in Radium Therapy..... 241

Sera, Vaccines, and Ferments

VAN SAUN, A. I.: The Wassermann Reaction with Diabetic Sera..... 242

Blood

LOEB, L.: The Organization of Blood-Clots After Auto,- Homo,- and Heterotransplantation..... 242
MCCANN, F.: Suggestions for the Prevention of Postoperative Thrombosis and Embolism..... 243

Blood and Lymph Vessels

GATELLIER: Some Considerations upon Vascular Wounds with Reference to a Case of Arterial Intubation..... 244

Roentgenology

BOGGS, R. M.: The Treatment of Carcinoma of the Breast by the Roentgen Ray..... 214
GEORGE, A. W., LEONARD, R. D., and O'BRIEN, F. W.: Roentgen Diagnosis of Disease of the Upper Right Abdominal Quadrant..... 217
FISCHER, I. F.: Examination of Gall-Stones by Roentgen Rays..... 225
ARMSTRONG, R. B.: The Part X-Ray Plays in the Treatment of Cancer..... 244
CASE, J. T.: A Brief Summary of the Indications for Roentgenotherapy..... 244
FULLERTON, A.: The Use of the Opaque Ureteral Catheter to Localize Missiles in the Region of the Kidney and Ureter..... 245
SHEARER, J. S.: Localization of Foreign Bodies; the Standard Methods Approved by the Surgeon General's Office, U. S. Army..... 245

MILITARY SURGERY

CANNON, W. B., FRASER, J., and COWELL, E. M.: The Preventive Treatment of Wound Shock.... 199
FIESSINGER, N., and CLOGNE, R.: Biological Study of the Action of Alkaline Hypochlorites in the Treatment of War Wounds..... 201
TAYLOR, W. H., and TAYLOR, N. B.: Liquid-Tight Closure and the Treatment of Wounds..... 201
PHOCAS: Early and Total Discontinuance of Dressings in Surgical Wounds..... 202
PEARSON, W.: Splints for Use in Arm, Ankle, and Leg Injuries, with Some Observations on Treatment..... 203
SPEED, K.: Gunshots of the Head, with Especial Reference to Indications for Operation and Technique; Demonstration of Cases..... 204
SHARPE, W.: Fractures of the Skull; the Resulting Intracranial Pathology and the Treatment..... 206
GRAY, H. M. W.: Treatment of War Wounds of the Brain and Its Coverings at Casualty Clearing Stations..... 207
CUSHING, H.: Study of a Series of Wounds Involving the Brain and Its Enveloping Structures..... 209
EASTMAN, J. R.: Hæmothorax in Gunshot Wounds.. 214
COSTANTINI, H., and VIGOT, M.: Immediate Operation in War Wounds of the Heart..... 216
KERR, N.: Triple Wounds of the Stomach from a Single Intact Bullet..... 221
SCALONE, I.: Splenectomy for Necrotic Spleen After Gunshot..... 226
SAINT, C. F. M.: Abdominal Operations at an Advanced Operating Center..... 228
COUTEAUD: Prognosis of Gunshot Fractures of the Thigh..... 232
ROUVILLOIS, H., and GUILLAUME-LOUIS: The Treatment of War Fractures..... 232
MAYO-ROBSON, A. W.: Conservative Surgery of the Hand as Illustrated by a Case of Tendon Grafting 233
MOUCHET, A., and PAMART: The End-Results of Arthrotomies of the Knee..... 234
GAUDIANI, V.: Kineplastic Amputations..... 235
COUTEAUD: Spinal Injuries of War..... 236
HUGHES, D. M.: Laminectomy for Gunshot Wound 236
DELAGENIÈRE, H.: Surgical Treatment of Nerve Wounds; Operative Technique and Results of 245 Cases of Suture and 113 Liberations..... 237
YOUNG J. K.: Gunshot Wound of the Posterior Cord of the Brachial Plexus..... 238
MASSON, P.: Botryomycotic Gunshot Wound..... 239
BAYLISS, W. M.: Intravenous Injection in Wound Shock..... 239
DELAUNAY, H.: Intravenous Injection of Locke's Serum with Gum Arabic in the Treatment of Severe Hæmorrhagic Hypotension and Shock... 240
GATELLIER: Vascular Wounds with Reference to a Case of Arterial Intubation..... 244
FULLERTON, A.: The Use of the Opaque Ureteral Catheter to Localize Missiles in the Region of the Kidney and Ureter..... 245
SHEARER, J. S.: Localization of Foreign Bodies; the Standard Methods Approved by the Surgeon General's Office, U. S. Army..... 245
CHARLES, R.: Gunshot Wounds of the Abdomen at a Casualty Clearing Station..... 246
BOWLBY, A.: Primary Suture of Wounds at the Front in France..... 247
BREWER, I. W.: The Physical Condition of American Men of Military Age..... 248
CATHELIN, F.: War Wounds of the Bladder..... 261
CHALIER, A., and GIÉNARD, R.: War Wounds of the Genito-Urinary Organs..... 264
ROY, D.: Removal of Foreign Bodies from the Eyeball and Orbital Cavity; Report of Cases..... 265
MURRAY, W. R.: The Vestibular Apparatus and Its Relation to Aviation..... 265

GYNECOLOGY

Uterus

HEINEBERG, A.: Bloodless Repair of the Cervix Uteri 249

BÉGOUIN, P.: A Method of Abdominal Hysterectomy for Fibroma with Lower Pole Impacted; Excavation Method 249

WOBUS, R. E.: The Acetone Treatment of Uterine Cancer 249

MCDONALD, A.: Abdominal Uterine Hæmorrhage in Young Women 250

Adnexal and Periuterine Conditions

GRAD, H.: Study of 100 Cases of Pyosalpinx 251

Miscellaneous

PHILLIPS, J.: The Therapeutic Influence of X-rays on Female Pelvic Disease 251

OBSTETRICS

Pregnancy and Its Complications

ACHARYA, S. R.: Abdominal Pregnancy 252

POLAK, J. O.: Diagnosis of Unruptured Ectopic Pregnancy 252

GARDNER, W. S.: The Cause of Tubal Pregnancy ... 252

EDGAR, J. C.: The Treatment of Eclampsia 253

MANUECO: Comparison Between Pubiotomy and the Cæsarean Operation in Moderate Pelvic Strictures 253

MORSE, A. H.: Premature Separation of the Normally Implanted Placenta 254

BERRI, I. C.: An Interesting Breus Mole 254

SMITH, F. H.: Urinary Infections of Pregnancy and the Puerperium 254

Labor and Its Complications

PALMER, C. B.: Obstetrical Anæsthesia 255

Puerperium and Its Complications

INFANTOZZI, J.: Treatment of Puerperal Endometritis by Permanent Drainage 255

WATSON, B. P., and SCOTT, W. A.: Analysis of Clinical Types of Puerperal Fever, with Special Reference to Prognosis and Treatment 256

GENITO-URINARY SURGERY

Kidney and Ureter

BLACK, K.: Case of Calculous Pyonephrosis 257

CULVER, H., HERROLD, R. D., and PHIFER, F. M.: Renal Infections; a Clinical and Bacteriologic Study 257

MARTIN, S. P.: Hydronephrosis as an Underlying Cause in Attacks of Acute Abdominal Pain 257

BUGBEE, H. G.: The Management of Renal Tuberculosis 258

MOORE, C. U.: Renal Function Test in Children 259

TENNEY, B.: Renal and Ureteral Stone 259

EISENDRATH, D. N.: Varieties of Ureteral Strictures. 259

Bladder, Urethra, and Penis

BOROBIO, P.: Bladder Calculi in Infancy 260

COOK, P. H.: An Unusual Case of Vesical Calculus.. 261

LOUMEAU: A Large Vesical Calculus Dating from Infancy 261

CATHELIN, F.: War Wounds of the Bladder 261

MENDEZ, A.: Vesical Miasis 262

PEDERSEN, J.: The Proof of Cure in Gonococcic Urethritis 262

Genital Organs

LESPINASSE, V. D.: Impotency; Its Treatment by Transplantation of Testicle 262

HYMAN, A.: Anatomic Results After Prostatectomy. 263

MARTIN, C.: End-Results in the Prostatectomized Patient; a Comparative Analysis, Based on 110 Cases 263

Miscellaneous

CHALIER, A., and GLÉNARD, R.: War Wounds of the Genito-Urinary Organs 264

SURGERY OF THE EYE AND EAR

Eye

ROY, D.: Removal of Foreign Bodies from the Eyeball and Orbital Cavity; Report of Cases 265

HOARE, W. W.: Some Points in the Operative Technique and After-Treatment of Senile Cataract Extraction 265

CARHART, W. M. D.: Differential Diagnosis and Treatment of Follicular Conjunctivitis..... 265
MURRAY, W. R.: The Vestibular Apparatus and Its Relation to Aviation..... 265
BROSE, L. D.: Ocular Tuberculosis..... 266
FERNANDEZ, J. S.: Diseases of the Eyes in Cuba.... 266
GREEN, J., JR.: The Treatment of Pneumococcus Ulcer of the Cornea with the Thermophore..... 266
CARR, A. M.: The Narrowing of the Pupil Does Not Lower Normal Intra-Ocular Tension..... 266

Ear

WALTHAL, D. O.: Recovery of a Case of Purulent Meningitis Complicating Mastoiditis..... 207
STIMSON, G. W.: The Static Labyrinth..... 267
HUNTINGTON, W. H.: Mastoiditis..... 267
HAYS, H.: Tubercular Mastoiditis; Radical Operation Under Cocaine Anæsthesia..... 268
MACKENZIE, G. W.: Syphilis of the Inner Ear and Eighth Nerve..... 268
MAYBAUM, J. L.: Causation of Tinnitus Aurium..... 268

SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

STEIN, O. J.: Pituitary Tumors from the Surgical Standpoint of the Rhinologist..... 269

Throat

JUDD, E. S., NEW, G. B., and MANN, F. C.: The Effect of Trauma upon the Laryngeal Nerves... 205
BECK, J. C.: Further Report on the Treatment of Malignant Disease of the Larynx; Management and Statistics of Malignant Disease of the Respiratory Tract..... 269

Mouth

HAINES, H. A.: Vincent's Angina from the Oral Surgical Standpoint..... 270
IVY, R. H.: Anatomy of the Teeth and Jaws, with Special Reference to Roentgenogram Interpretation..... 270

BIBLIOGRAPHY

GENERAL SURGERY

SURGICAL TECHNIQUE
- Operative Surgery and Technique 271
- Aseptic and Antiseptic Surgery 271
- Anæsthetics 272
- Surgical Instruments and Apparatus 272

SURGERY OF THE HEAD AND NECK
- Head 272
- Neck 273

SURGERY OF THE CHEST
- Chest Wall and Breast 273
- Trachea and Lungs 273
- Heart and Vascular System 274
- Pharynx and Œsophagus 274

SURGERY OF THE ABDOMEN
- Abdominal Wall and Peritoneum 274
- Gastro-Intestinal Tract 274
- Liver, Pancreas and Spleen 275
- Miscellaneous 276

SURGERY OF THE EXTREMITIES
- Diseases of Bones, Joints, Muscles, Tendons. General Conditions Commonly Found in the Extremities 276
- Fractures and Dislocations 276
- Surgery of the Bones, Joints, Etc. 277
- Orthopedics in General 277

SURGERY OF THE SPINAL COLUMN AND CORD 278

SURGERY OF THE NERVOUS SYSTEM 278

MISCELLANEOUS
- Clinical Entities—Tumors, Ulcers, Abscesses, Etc. 278
- Sera, Vaccines, and Ferments 279
- Blood 279
- Blood and Lymph Vessels 280
- Poisons 280
- Roentgenology 280
- Hospital, Medicolegal, and Medical Education .. 280
- Military Surgery 281

GYNECOLOGY

- Uterus 281
- Adnexal and Periuterine Conditions 282
- External Genitalia 282
- Miscellaneous 282

OBSTETRICS

- Pregnancy and Its Complications 282
- Labor and Its Complications 282
- Puerperium and Its Complications 283
- Miscellaneous 283

GENITO-URINARY SURGERY

- Kidney and Ureter 283
- Bladder, Urethra, and Penis 284
- Genital Organs 284
- Miscellaneous 284

SURGERY OF THE EYE AND EAR

- Eye 284
- Ear 285

SURGERY OF THE NOSE, THROAT, AND MOUTH

- Nose, Throat, and Mouth 285

CONSULTING EDITORIAL STAFF

GENERAL SURGERY—Continued

Jackson E. S. Judd C. E. Kahlke Arthur A. Law Robert G. LeConte Dean D. Lewis Archibald Maclaren Edward Martin Rudolph Matas Charles H. Mayo William J. Mayo John R. McDill Stuart McGuire Lewis S. McMurtry Willy Meyer James E. Moore Fred T. Murphy James M. Neff Edward H. Nichols A. J. Ochsner Charles H. Peck J. R. Pennington S. C. Plummer Charles A. Powers Joseph Ransohoff H. M. Richter Emmet Rixford H. A. Royster W. E. Schroeder Charles L. Scudder M. G. Seelig E. J. Senn John E. Summers James E. Thompson Herman Tuholske John W. Turner George Tully Vaughan John R. Wathen. CANADA: E. W. Archibald G. E. Armstrong H. A. Bruce I. H. Cameron Jasper Halpenny J. Alex Hutchison Francis J. Shepherd F. N. G. Starr T. D. Walker. ENGLAND: H. Brunton Angus Arthur E. Barker Sir Watson Cheyne W. Sampson Handley Sir Arbuthnot Lane G. H. Makins Robert Milne Sir Berkeley Moynihan Rushton Parker Harold J. Stiles Gordon Taylor. IRELAND: William Ireland de C. Wheeler.

GYNECOLOGY AND OBSTETRICS

AMERICA: Frank T. Andrews Brooke M. Anspach W. E. Ashton J. M. Baldy Channing W. Barrett Herman J. Boldt J. Wesley Bovée LeRoy Broun Henry T. Byford John G. Clark Edwin B. Cragin Thomas S. Cullen Edward P. Davis Joseph B. DeLee Robert L. Dickinson W. A. Newman Dorland E. C. Dudley Hugo Ehrenfest C. S. Elder Palmer Findley Henry D. Fry George Gellhorn J. Riddle Goffe Seth C. Gordon Barton C. Hirst Joseph T. Johnson Howard A. Kelly Albert F. A. King Florian Krug L. J. Ladinski H. F. Lewis Frank W. Lynch Walter P. Manton James W. Markoe E. E. Montgomery George C. Mosher Henry P. Newman George H. Noble Charles E. Paddock Charles B. Penrose Reuben Peterson John O. Polak William M. Polk Charles B. Reed Edward Reynolds Emil Ries John A. Sampson F. F. Simpson Richard R. Smith William S. Stone H. M. Stowe William E. Studdiford Frederick J. Taussig Howard C. Taylor Hiram N. Vineberg W. F. B. Wakefield George G. Ward, Jr. J. Whitridge Williams. CANADA: W. W. Chipman William Gardner F. W. Marlow K. C. McIlwraith B. P. Watson A. H. Wright. ENGLAND: Russell Andrews Thomas W. Eden W. E. Fothergill T. B. Hellier Thomas Wilson. SCOTLAND: William Fordyce J. M. Munro Kerr. IRELAND: Henry Jellett Hastings Tweedy. AUSTRALIA: Ralph Worrall. SOUTH AFRICA: H. Temple Mursell. INDIA: Kedarnath Das.

GENITO-URINARY SURGERY

AMERICA: William L. Baum William T. Belfield Joseph L. Boehm L. W. Bremerman Hugh Cabot John R. Caulk Charles H. Chetwood John H. Cunningham, Jr. Francis R. Hagner Robert Herbst Edward L. Keyes, Jr. Gustav Kolischer F. Kreissl Bransford Lewis G. Frank Lydston Granville MacGowan L. E. Schmidt J. Bentley Squier B. A. Thomas William N. Wishard Hugh H. Young Joseph Zeisler. ENGLAND: J. W. Thomson Walker John G. Pardoe. INDIA: Mrigendralal Mitra.

ORTHOPEDIC SURGERY

AMERICA: E. C. Abbott Nathaniel Allison W. S. Baer Gwilym G. Davis Albert H. Freiberg Arthur J. Gillette Virgil P. Gibney Joel E. Goldthwait G. W. Irving Robert W. Lovett George B. Packard W. W. Plummer John L. Porter John Ridlon Edwin W. Ryerson Harry M. Sherman David Silver H. L. Taylor H. Augustus Wilson James K. Young. CANADA: A. Mackenzie Forbes Herbert P. H. Galloway Clarence L. Starr. ENGLAND: Sir Robert Jones A. H. Tubby George A. Wright.

ROENTGENOLOGY

AMERICA: Eugene W. Caldwell Russell D. Carman James T. Case L. Gregory Cole Preston M. Hickey Henry Hulst George C. Johnston Sidney Lange George E. Pfahler Hollis E. Potter. CANADA: Samuel Cummings Alexander Howard Pirie.

CONSULTING EDITORIAL STAFF

SURGERY OF THE EYE

AMERICA: C. H. Beard E. V. L. Brown H. D. Bruns Vard H. Hulen Edward Jackson Francis Lane W. P. Marple William Campbell Posey Brown Pusey Robert L. Randolph John E. Weeks Cassius D. Wescott William H. Wilder Casey A. Wood Hiram Woods. ENGLAND: J. B. Lawford W. T. Holmes Spicer. SCOTLAND: George A. Berry A. Maitland Ramsey.

SURGERY OF THE EAR

AMERICA: Ewing W. Day Max A. Goldstein J. F. McKernon Norval H. Pierce S. MacCuen Smith. CANADA: H. S. Birkett. ENGLAND: A. H. Cheatle. SCOTLAND: A. Logan Turner. IRELAND: Robert H. Woods.

SURGERY OF THE NOSE, THROAT, AND MOUTH

AMERICA: Joseph C. Beck T. Melville Hardie Thomas J. Harris Chrisham R. Holmes E. Fletcher Ingals Chevalier Jackson John N. MacKinzie G. Hudson Makuen George Paull Marquis John Edwin Rhodes. AUSTRALIA: A. J. Brady A. L. Kenney. INDIA: F. O'Kinealy.

ABSTRACT EDITORIAL STAFF

DEPARTMENT EDITORS

DEAN D. LEWIS — General Surgery
CHARLES B. REED — Gynecology and Obstetrics
LOUIS E. SCHMIDT — Genito-Urinary Surgery
JOHN L. PORTER — Orthopedic Surgery
HOLLIS E. POTTER — Roentgenology
FRANCIS LANE — Surgery of the Eye
NORVAL H. PIERCE — Surgery of the Ear
T. MELVILLE HARDIE — Nose and Throat

GENERAL SURGERY

AMERICA: Carroll W. Allen E. K. Armstrong I. W. Bach Donald C. Balfour H. R. Basinger George E. Beilby M. A. Bernstein R. B. Bettman I. E. Bishkow Walter M. Boothby C. A. Bowers Barney Brooks Walter H. Buhlig Eugene Cary Otto Castle Phillips M. Chase James F. Churchill Isidore Cohn Karl Connell Lewis B. Crawford V. C. David Nathan S. Davis III D. L. Despard V. E. Dudman A. Henry Dunn L. G. Dwan Frederick G. Dyas Albert Ehrenfried Ellis Fischel Ellis B. Freilich H. H. Freilich Isaac Gerber Herman B. Gessner Donald C. Gordon F. P. Hammond Torr Wagner Harmer James P. Henderson Charles Gordon Heyd Lester H. Hills G. W. Hochrein Robert H. Ivy P. H. Kreuscher Harold P. Kuhn J. J. Kurlander Lucian H. Landry Felix A. Larue Halsey B. Loder William Carpenter MacCarty Urban Maes B. F. McGrath R. W. McNealy M. M. Miller Alfred H. Noehren Eugene J. O'Neill Matthew W. Pickard Frank W. Pinneo Eugene H. Pool Martin B. Rehling E. C. Riebel Floyd Riley E. C. Robitshek M. J. Seifert O. R. Sevin J. H. Skiles P. G. Skillern, Jr. Harry G. Sloan John Smythe Carl R. Steinke P. W. Sweet Lister H. Tuholske Henry J. Van den Berg W. M. Wilkinson Espy M. Williams Erwin P. Zeisler. ENGLAND: James E. Adams Percival Cole Arthur Edmonds I. H. Houghton Robert E. Kelly William Gilliatt B. C. Maybury Eric P. Gould T. B. Legg Felix Rood E. G. Schlesinger B. Sangster Simmonds Harold Upcott O. G. Williams. SCOTLAND: John Fraser A. P. Mitchell Henry Wade D. P. D. Wilkie. IRELAND: R. Atkinson Stoney.

GYNECOLOGY AND OBSTETRICS

AMERICA: S. W. Bandler A. C. Beck Daniel L. Borden D. H. Boyd Anna M. Braunwarth W. L. Brown E. A. Bullard W. H. Cary Sidney A. Chalfant Edward L. Cornell A. H. Curtis Carl Henry Davis F. C. Esselbruegge Lillian K. P. Farrar Howard G. Garwood Maurice J. Gelpi Luba R. Goldsmith C. D. Hauch N. Sproat Heaney T. Leacraft Hein D. S. Hillis John C. Hirst C. D. Holmes F. C. Irving Norman L. Knipe George W. Kosmak H. W. Kostmayer R. H. Kuhns Julius Lackner Herman Lober Rafiel Lorini Donald Macomber Harvey B. Matthews L. P. Milligan Arthur A. Morse Ross McPherson

ABSTRACT EDITORIAL STAFF

GYNECOLOGY AND OBSTETRICS—Continued

Albert E. Pagan George W. Partridge Wm. D. Phillips Heliodor Schiller A. H. Schmitt Henry Schmitz Edward Schumann Emil Schwarz J. M. Slemons Camile J. Stamm Arnold Sturmdorf George de Tarnowsky S. B. Tyron Marie L. White P. F. Williams R. E. Wobus. CANADA: James R. Goodall H. M. Little. ENGLAND: Harold Chapple Harold Clifford F. H. Lacey W. Fletcher Shaw Clifford White. SCOTLAND: H. Leith Murray J. H. Willett.

GENITO-URINARY SURGERY

AMERICA: Charles E. Barnett J. D. Barney B. S. Barringer Horace Binney J. B. Carnett Harry Culver Theodore Drozdowitz J. S. Eisenstaedt H. A. Fowler F. E. Gardner Louis Gross H. G. Hamer Thomas C. Holloway I. S. Koll H. A. Kraus Herman L. Kretschmer Victor D. Lespinasse William E. Lower Francis M. McCallum Harvey A. Moore Stirling W. Moorhead A. Nelken C. O'Crowley Edward A. Oliver R. F. O'Neil H. D. Orr C. D. Pickrell H. W. Plaggemeyer H. J. Polkey Jaroslav Radda S. W. Schapira George G. Smith A. C. Stokes L. L. Ten Broeck G. J. Thomas H. W. E. Walther Carl Lewis Wheeler H. McClure Young. ENGLAND: J. Swift Joly Sidney G. Macdonald. IRELAND: Andrew Fullerton S. S. Pringle Adams A. McConnell.

ORTHOPEDIC SURGERY

AMERICA: Charles A. Andrews A. C. Bachmeyer George I. Baumann George E. Bennett Ralph S. Bromer Lloyd T. Brown C. Hermann Bucholz C. C. Chatterton W. A. Clark Robert B. Cofield Alex R. Colvin Arthur J. Davison Frank D. Dickson F. J. Gaenslen M. S. Henderson Phillip Hoffman C. M. Jacobs S. F. Jones F. C. Kidner F. W. Lamb Philip Lewin Paul B. Magnuson James R. Martin George J. McChesney H. W. Meyerding H. W. Orr Archer O'Reilly Robert G. Packard H. A. Pingree Robert O. Ritter J. W. Sever John J. Shaw Arthur Steindler Charles A. Stone Paul P. Swett H. B. Thomas James O. Wallace James T. Watkins C. E. Wells DeForest P. Willard H. W. Wilcox. CANADA: D. Gordon Evans. ENGLAND: Howard Buck E. Rock Carling Naughton Dunn E. Laming Evans W. H. Hey John Morley T. P. McMurray Charles Roberts G. D. Telford.

ROENTGENOLOGY

AMERICA: David R. Bowen John G. Burke William Evans Isaac Gerber Amedee Granger G. W. Grier Adolph Hartung Arthur Holding C. B. Hollings Leopold Jaches Albert Miller Edward H. Skinner David C. Strauss Frances E. Turley J. D. Zulick.

SURGERY OF THE EYE

AMERICA: E. W. Alexander N. M. Brinkerhoff J. Sheldon Clark C. G. Darling T. J. Dimitry J. B. Ellis E. B. Fowler Lewis J. Goldbach Harry S. Gradle J. Milton Griscom D. Forest Harbridge Emory Hill Gustavus I. Hogue S. S. Howe E. F. Krug G. Dvorak Theobald Walter W. Watson. ENGLAND: F. J. Cunningham M. L. Hepburn Foster Moore. SCOTLAND: John Pearson Arthur Hy. H. Sinclair Ramsey H. Traquair James A. Wilson.

SURGERY OF THE EAR

AMERICA: H. Beattie Brown J. R. Fletcher A. Spencer Kaufman Robert L. Loughren Otto M. Rott W. H. Theobald T. C. Winters. CANADA: H. W. Jamieson. ENGLAND: G. J. Jenkins. SCOTLAND: J. S. Fraser. IRELAND: T. O. Graham.

SURGERY OF THE NOSE, THROAT, AND MOUTH

AMERICA: George M. Coates M. N. Federspiel Carl Fischer James J. King R. Clyde Lynch Ellen J. Patterson H. A. Potts. AUSTRALIA: V. Munro. INDIA: John T. Murphy.

AUTHORS

OF THE ORIGINAL CONTRIBUTIONS WHICH ARE ABSTRACTED IN THIS NUMBER

Acharya, S. R., 252
Armstrong, R. B., 244
Babcock, W. W., 233
Bayliss, W. M., 239
Beck, J. C., 269
Bégouin, P., 249
Berri, I. C., 254
Black, K., 257
Boggs, R. H., 214
Borobio, P., 260
Bowlby, A., 247
Brewer, I. W., 248
Brose, L. D., 266
Bugbee, H. G., 258
Campbell, W. C., 235
Cannon, W. B., 199
Carhart, W. M. D., 265
Carr, A. M., 266
Carroll, E. P., 236
Case, J. T., 244
Cathelin, F., 261
Chalier, A., 264
Charles, R., 246
Chueco, A., 220
Clogne, R., 201
Cofield, R. B., 234
Cook, P. H., 261
Costantini, H., 216
Couteaud, 232, 236
Cowell, E. M., 199
Crile, D. W., 203
Culver, H., 257
Cushing, H., 209
Delagenière, H., 237
De Lange, C., 227
Delaunay. H., 240
Delmas, J., 196
Desmaret, 223
Dowd, C. N., 213
Earl, G., 230
Eastman, J. R., 214
Edgar, J. C., 253
Edwards, F. S., 224
Eisendrath, D. N., 259
Elliott, C. A., 226
Ferguson, R. S., 233
Fernandez, J. S., 266
Fiessinger, N., 201
Finochietto, R., 221
Fiolle, J., 196
Fischer, I. F., 225
Fraser, J., 199
Fullerton, A., 245
Gardner, W. S., 252
Gatellier, 244
Gatewood, L., 205
Gaudiani, V., 235
George, A. W., 217
Glénard, R., 264
Gottlieb, A., 235
Grad, H., 251
Gray, H. M. W., 207
Green, J., Jr., 266
Guillaume-Louis, 232
Guillermo, M. L., 217
Gwathmey, J. T., 203
Haines, H. A., 270
Hall-Edwards, J., 232
Hassin, G. B., 236
Hays, H., 268
Heineberg, A., 249
Herrold, R. D., 257
Heyd, C. G., 227
Hoare, W. W., 265
Holmgren, I., 215
Hotchkiss, L. W., 218
Hughes, D. M., 236
Huntington, W. H., 267
Hussey, F. V., 228
Hyman, A., 263
Infantozzi, J., 255
Ivy, R. H., 270
Janeway, H. H., 205
Jones, N. W., 220
Judd, E. S., 205, 226
Karsner, H. T., 203
Kerr, N., 221
Kirmisson, E., 230
Laplace, E., 222
Leonard, R. D., 217
Lespinasse, V. D., 262
Loeb, L., 242
Loumeau, 261
MacKenzie, G. W., 268
Mann, F. C., 205
Manueco, 253
Martin, C., 263
Martin, S. P., 257
Masson, P., 239
Maybaum, J. L., 268
Mayer, L., 235
Mayo, W. J., 224
Mayo-Robson, A. W., 233
McCann, F., 243
McDonald, A., 250
McDonald, A. L., 222
Mendez, A., 262
Montoya, J. M., 217
Moore, C. U., 259
Morelli, E., 215
Morison, A. E., 202
Morse, A. H., 254
Mottram, J. C., 241
Mouchet, A., 234
Murray, W. R., 265
New, G. B., 205
O'Brien, F. W., 217
Opie, E. L., 231
Palmer, C. B., 255
Pamart, 234
Pearson, W., 203
Pedersen, J., 262
Phifer, F. M., 257
Phillips, J., 251
Phocas, 202
Pierson, P. H., 214
Pinkham, E. W., 222
Polak, J. O., 252
Pybus, F. C., 221
Ramey, R. L., 231
Rayner, H. H., 219
Ribas y Ribas, E., 238
Richards, O., 229
Rouvillois, H., 232
Roy, D., 265
Russ, S., 241
Saint, C. F. M., 228
Salmon, A., 213
Scalone, I., 226
Schippers, J. C., 227
Scott, W. A., 256
Sharpe, W., 206
Shearer, J. S., 245
Simpson, J. A., 232
Smith, E. H., 235
Smith, F. H., 254
Speed, K., 204
Stapelmohr, S. von, 219
Stein, O. J., 269
Stimson, G. W., 267
Syms, P., 217
Taylor, N. B., 201
Taylor, W. H., 201
Tenney, B., 259
Thun, H. von, 218
Van Saun, A. I., 242
Vigot, M., 216
Walthal, D. O., 207
Watson, B. P., 256
Willems, C., 231
Wobus, R. E., 231, 249
Wright, J. S., 221
Young, J. K., 238

INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1918

COLLECTIVE REVIEW

GAS GANGRENE

By ABRAHAM O. WILENSKY, M.D., New York

The following synonyms for gas gangrene have been used by different authors: molecular gangrene; traumatic emphysema; acute putrid infection; acute gangrenous septicæmia; spreading traumatic gangrene; emphysematous gangrene; acute gangrenous œdema; serous gangrenous infiltration; primary mephitic gangrene; progressive gangrenous emphysema; gas phlegmon; acute microbic or bacillary gangrene; fulminating (foudroyante) gangrene; gangrenous cellulitis; malignant œdema; anaerobic gangrene; war gangrene; erysipele bronzé (Velpeau).

INFECTIONS of the human body, characterized by the production of gas in the tissues both before and after death, have been known for a long time. The first classical descriptions of this disease were made by Maisonneuve in 1852 and by Pirogoff in 1864 and resulted directly from an abundant experience gained in the treatment of wounds during the European wars of the middle half of the last century. Injuries due to firearms or other causes, with the similar complication of gas production, had also been noted in civil life. "Foamy" organs have also been seen from time to time in the autopsy room; these resulted from general infections and might occur in a postabortive or postpartum period, or might find their origin in any of the other body systems, such as the gastro-intestinal or genito-urinary tracts.

Special attention has always been directed toward gas infections which have complicated civil or military injuries, the first from the rather dramatic sequence of events, the second from the large numbers of wounded in whom gas appeared in the wound, and in both, because of the large number of fatal results. The explanation in prebacteriological days was rather crude and it was assumed that the gas resulted from the reaction of the atmospheric air with decomposing tissues, especially fat and bone-marrow, which had resulted from severe trauma.

The cause for the gas production was finally discovered by Welch, in 1891, to be bacterial and full descriptions of his discovery were reported by Welch and Nuttal in 1892. Abroad the first report was made by Fraenkel, and his very valuable monograph written in 1893 deals with the subject of gas phlegmons. The etiological cause was described as a bacillus called by Welch the bacillus aerogenes capsulatus, and by Fraenkel the bacillus phlegmonis emphysematosæ.

BACTERIOLOGY

In all of the reported cases this bacillus is found to be growing in symbiosis with other bacteria; and from time to time reports have appeared in which one of these other organisms have occurred in a gas infection in which the Welch bacillus was not found. It is most generally believed, however, that the other organisms are relatively subsidiary and the consensus of opinion makes the bacillus aerogenes capsulatus the chief offender.

The actual bacterial flora in traumatic wounds with a complicating gas infection is constantly similar, and the organisms found nearly always include the following: bacillus aerogenes capsulatus, bacillus of malignant œdema, bacillus proteus vulgaris, bacillus pseudo-œdematis maligni, bacillus coli communis, staphylococcus, and streptococcus. The frequency with which the various organisms are found in cases of gas gangrene was lately determined by Ivens in a

series of 107 wounded soldiers to be as follows: bacillus perfringens was found in nearly every case; bacillus sporogenes in 41 cases; vibrion septique in 6 cases; streptococcus in 59 cases; tetanus bacillus in 15 cases; bacillus histolitycus, bacillus Hibler IX, and bacillus œdematiens less frequently.

The relative frequency with which anaerobic bacteria are found in cases of gas gangrene was determined by Weinberg and Seguin in a series of 91 cases. The following percentages were found: bacillus perfringens, 77 per cent; bacillus œdematiens, 34 per cent; bacillus sporogenes, 27 per cent; bacillus fallax, 16.5 per cent; vibrion septique, 13 per cent; bacillus histolitycus, 9 per cent; bacillus aerofœtidus, 5.5 per cent; bacillus putrificus, 2 per cent; bacillus bifermantis, 2 per cent; bacillus Ghon-Sachs II, 1 per cent; bacillus tertius, 1 per cent; bacillus tetanus, 10 per cent.

Bacillus aerogenes capsulatus (bacillus phlegmonis emphysematosæ of Fraenkel; bacillus enteridis sporogenes of Klein; bacillus perfringens of Veillon) has a wide distribution in nature and is found in the soil, dust, brackish water, and in the normal intestinal tracts of humans and animals. The organisms are large, non-motile, Gram-positive bacilli inconstantly showing spores. Capsules can be demonstrated in organisms taken directly from animal tissues. In animals dying with this infection, the body becomes enormously distended with gas, which, on being liberated and ignited, burns with a pale blue flame.

Bacillus œdematis maligni (vibrion septique of Pasteur) was shown by Gaffky and others to be also widely distributed in nature and in the intestines of humans and animals. The organisms are long, motile, Gram-negative rods with spores; the latter are very resistant.

Bacillus proteus vulgaris. Organisms of the proteus group are very frequently encountered in routine bacteriological work and show superficial similarities to organisms of the colon-typhoid group. They are slightly pathogenic and in man are found in conjunction with other bacteria.

Bacillus tetani. This organism is a long slender rod which grows anaerobically and whose spores are very resistant. The spores are found with special frequency in highly cultivated and manured fields (the present fighting grounds).

Bacillus sporogenes (bacillus cadaveris sporogenes of Metchnikoff). This is a long slender bacillus which resembles the vibrion septique. It is characterized by producing a putrid destruction of tissues by the aid of a proteolytic ferment which it secretes.

Bacillus œdematiens. This is a strain of the perfringens organism, described by Weinberg and Seguin, which is characterized by an extraordinary toxicity and extensive œdematous infiltrations, which resembles very much a "white" erysipelas. The organism is difficult to isolate. Other strains are the bacillus bellonensis of Sacquépée, the bacillus sarcoemphysematodes hominis of Conradi and Bieling, and the "gasodembazillus" of Aschoff.

Bacillus fallax. This organism has only lately been described by Weinberg and Seguin. It combines the morphology of the vibrion septique, the faculty of producing extensive œdema of the œdematiens bacillus and the gas-producing properties of the perfringens organisms.

Bacillus histolyticus is a variety of the perfringens bacillus and causes necrosis of tissues. It is morphologically identical with the Welch bacillus, but produces no gas in the cultures.

Bacillus Hibler IX is a strain of the Fraenkel bacillus.

Bacillus Ghon-Sachs II is either identical, or closely allied, with the bacillus of malignant œdema. All the other organisms mentioned, with the exception of bacillus coli communis, the streptococcus and the staphylococcus, are anaerobic, are very commonly encountered in the intestinal contents, and develop toxins which have a mild pathogenicity. Bacillus coli communis, streptococci and staphylococci need no special description.

Douglas, Fleming and Colebrook interpret their bacteriological findings thus: It appears that the primary infection is fæcal and the bacterial content of the wound includes anaerobes, perfringens bacilli and putrefactive organisms, streptococci, bacillus proteus and diphtheroids. As the wound progresses, the anaerobes gradually disappear and leave behind streptococci, staphylococci, diphtheroids and occasionally bacillus proteus. In the early stages of the wound bacillus perfringens, bacillus œdematis maligni and streptococci make most of the trouble; in the later stages, streptococci are responsible for all serious complications.

PATHOLOGY

The wounds in which gas infection commonly develops are large and are marked by extensive destruction. The character of the wound may be immediately visible; or the affected limb may bear a comparatively small and apparently insignificant wound which on exploration reveals a very much larger subcutaneous injury. The path or paths of the single bullet, or of the multiple

shell fragments, are lined by pulpified soft tissues and comminuted bone, and form irregular ramifying pockets which are deep and tortuous. The most inaccessible of these constantly harbor various foreign bodies,— fragments of devitalized bone, bullets, fragments of shell or shrapnel, splinters of wood, dirt, torn-off pieces of clothing, the latter frequently contaminated with fæcal matter. Always the wound extends into muscle, and so constant is this finding that the opinion has been frequently expressed (Wallace, McNee and Dunn, and others) that gas gangrene will not occur in the absence of muscle injury. Hæmatoma formation varies from numerous small collections to large masses which infiltrate in all directions and effectively hide the source of the bleeding. Macroscopic blood-vessel injury is common and frequently the main artery of the limb is torn and the resulting gangrene prepares the way for a massive gas infection. The surfaces of the wound are ground thoroughly full of dirt; the odor is foul; and the discharge is thin and sanguinous when the infection is by the gas organism alone, or purulent when the latter is contaminated with pyogenic bacteria.

Bashford has given the best description of the microscopical pathology. Nearest to the surface of injury is a zone of dead muscle fibers (dark staining) embedded in disorganized blood-clot. Next is a zone of "ground-glass" appearing fibers, which are also dead. Outside of this the fibers are greatly fragmented and depart from the normal in being widely separated and in often losing their cross-striation. Bundles like these are interspersed with normal looking bundles or with those in which the fibers are broken into longitudinal fragments. Bashford believes this fragmentation not to be specific; it is due usually to improper histological fixation and can be reproduced in any laboratory animal.

The muscle sheath shows hæmorrhage and leucocytic infiltration, as well as dilated and engorged vessels. The fibrous tissue is densely infiltrated with leucocytes and this is most abundant where the bacteria are in greatest variety. The infiltration extends into adjacent muscle fibers for a distance of several longitudinal layers, but ends abruptly between any two bundles. As soon as the endomysial space becomes crowded with bacilli the leucocytic infiltration stops, and only rarely are any bacilli seen in the leucocytic zone.

Bubbles of gas can be seen with the naked eye and many more are visible with the microscope between the muscle fibers or bundles, beneath the sheath and in the sheath itself. They are invariably between bundles of fibers and never in the fibers themselves. The arrangement of leucocytes and bacteria around a bubble is constant; they appear to have been pushed aside. The muscle fibers also appear as if pushed aside, but nowhere do they show signs of pressure; the same appearance of lack of pressure is seen in the leucocytic infiltration and in the capillaries.

At the site of injury the bacteria in abundant flora are gathered very thickly. For a short distance from the edge they appear more abundant, but deep down they seem to be composed wholly of long bacilli. The sheath of the muscle is invaded for a short distance. Most of the bacteria have invaded into the lymph-spaces. As they proliferate, the bacteria follow the track of the vessels: from the lymph space they spread along the capillaries, and apply themselves closely to their walls or to the sarcolemma of adjacent fibers; and are often arranged longitudinally. The bacteria are nowhere found in capillaries. The muscle fibrils themselves are entered only when the sarcolemma is destroyed. Along the capillaries, in a region of moderate infection, leucocytes are present and are actively phagocytic.

At the margin of bacillary invasion the muscle fibrils in some places exhibit striation, in others are swollen and homogeneous; and there are irregularities in the number of sarcolemma nuclei. In some places the bundles are packed closely together, in others visibly separated; in the latter the resulting spaces are full of fresh or old, altered or homogeneous blood. The connective tissue fibers are œdematous and the capillaries stand out very prominently. Leucocytosis is scant or absent, and is a striking feature of the advancing margin of the pathological process. This is also marked in experimental infections in animals; in these the peritoneal, pleural, pericardial, and œdema fluids are also devoid of white blood-cells.

Circulatory disturbances. There is much extravasated blood in the tissues and an increased accumulation of fluid in the endomysial space. The endothelium is proliferated, or swollen and vacuolated. Later the capillaries and small veins rupture. These may become disintegrated and embedded in old or recent hæmorrhage. Thrombosed veins are common. No excess of polynuclear white cells are seen in the extravasations; mononuclears predominate. Thrombosis is common in all septic wounds and is the usual cause for secondary hæmorrhages. It is venous in origin in 70 per cent. Thrombosis is quite commonly seen on the proximal side of the wound. Ex-

tensive blocking may accompany small wounds. It may occur some distance from the wound. Capillary thrombosis may extend far ahead of the obvious infectious process.

The lymphatics are difficult to recognize. They may be obliterated by pressure, or may collapse because of the poor circulation. Bashford assumes that there must be similar changes as in other infections.

It is not common to find bacilli inside the blood-vessels, except when the blood is clotted or broken down. When found at the margin of invasion it indicates that bacilli are constantly entering the blood stream.

The rapidity of onset and of the spread of infection is truly remarkable and is the most astonishing thing of this disease. Chalier noted that in 108 cases of gas infection, the process was recognized within twenty-four hours in 16 per cent; in from three to six days in 18 per cent; and before the seventh day in all. McNee and Dunn saw the infection established in one soldier three and one-half hours after the reception of the wound; the fatal issue followed nine hours later. They suggest that the rapid spreading of the process is due to the anatomy of muscle, in which there are sheaths enclosing long fibers which are detachable. When so, detached spaces are formed within the sheath and the latter are quickly filled with toxic material which causes necrosis of the fibers.

FACTORS IN THE PRODUCTION OF GAS GANGRENE

Ivens classified the factors which aid in the development of gas gangrene as follows:

1. Proximity to contaminated soil. Gas gangrene develops three times as frequently in wounds of the lower limbs.
2. The kind of projectile. Shell wounds are followed six times as frequently as other injuries by gas gangrene.
3. The presence of foreign bodies. It has been repeatedly demonstrated that bullets, dirt, clothing, etc., both in the wounds and outside of the wounds, are constantly harboring the perfringens organisms. In some of the reports the frequency runs to 100 per cent.
4. The interval between the reception of the wound and the first dressing.
5. The importance of early treatment in the prevention of gas infection.
6. The presence of vascular injuries. This applies to the application of a tourniquet. Wallace points out that it is easy to distinguish between the purplish-brown dead muscle due to cutting off of the blood supply, and the non-contractile and peculiar translucent red color of muscle (which may or may not crepitate) dead of gas gangrene.
7. Concomitant fractures. Sixty per cent of wounds with gas gangrene also had fractures.
8. Location of the wound. Wounds of the calf, hip, or trunk are especially dangerous.
9. Much tissue injury.
10. Increase of the intramuscular tension.
11. Joint injuries. These were present in 13 per cent of wounds infected with gas organisms.

Emery points out that the growth of the gas organisms depends very largely upon the abundance of the sugar supply. That explains why muscle tissue plays so prominent a part in the pathological process. A number of men believe that gas gangrene will not develop in other tissues and believe that the subcutaneous gas is secondary and lodges under the skin after escaping from the muscle.

THE RELATIONSHIP OF THE BACTERIOLOGY TO THE PATHOLOGICAL PROCESS

Douglas, Fleming and Colebrook made a number of interesting experiments which elucidate a great many of the clinical facts. Bacillus perfringens was found to grow much more rapidly in symbiosis with streptococci, staphylococci, diphtheroids, bacillus proteus, bacillus pyocyaneus and a coliform bacillus, either singly or in groups. The growth was equal in amount in fresh serum, or in serum in which the alkalinity and the antitryptic power were neutralized. All strains of diphtheroids were found equally efficient in stimulating this growth. Under these conditions an infinitely smaller number of perfringens bacilli would grow than would when a pure culture was being grown. Bacillus perfringens and streptococci, grown in symbiosis, result in a more abundant growth of each organism. When the culture also includes staphylococci an enormous increase occurs in the cocci. Streptococci cultivated in symbiosis with diphtheroids give a much more abundant growth than when grown pure; the diphtheroids were, however, approximately 50 per cent less. Diphtheroids and other bacilli absorb oxygen, but this property is apparently not sufficient to account for the increased proliferation that occurs when aerobes and anaerobes are grown in symbiosis.

The bacillus œdematis maligni and the bacillus Hibler IX also grow much more rapidly when the cultivations include the other organisms mentioned above, and in the same groupings or combinations as were described.

The conditions of the wound reproduce with fidelity the artificial cultivations in the test tubes. The experiments explain the extreme rapidity of the growth and spread of the infectious process, since only a few organisms, growing in association with the other contaminants, are amply sufficient for a most virulent infection.

Tissier believes that anaerobic organisms do not develop their toxic properties except when grown in symbiosis with aerobes. However, Taylor, and Weinberg and Seguin have obtained no definitely significant results in laboratory experiments with combinations of aerobic and anaerobic organisms. Weinberg and Seguin worked very extensively with anaerobic organisms and determined that both the Welch bacillus and bacillus œdematiens were aided very greatly by the bacillus histolyticus in their growth and in the consequent spread of infection. It seems that a suitable culture medium is prepared for the gas organisms by the histolyticus bacillus, the latter causing a breaking down of the tissues into hæmorrhagic masses, in which antibacterial resistance is greatly lowered. Bacillus sporogenes also accomplishes the same result in a similar way. Especially fatal is the symbiosis of perfringens and œdematiens organisms: the combination stimulates one another; the œdematiens bacilli flourish more easily and extensively and overgrow the other; their superior toxicity usually determines the fatal result. These results can be reproduced in animals.

The pathology of gas gangrene has been explained in one of two ways: D'Este Emery believes that the toxin of the Welch bacillus is the sole cause of the process and that the toxins which are developed kill the leucocytes and prevent the emigration of white blood-cells into the healthy parts adjacent. The rapid spread of the infection is thus encouraged. Taylor agrees that the Welch bacillus is the sole agency, but disagrees as to the effect of the toxins. Taylor has determined that there is: (1) a bacillary endotoxin which has no toxic action in animals; (2) a bacillary exotoxin which seems to be a definite proteolytic substance and which exhibits the main toxic manifestations; (3) a tissue toxin which is developed in the destroyed tissues. The clinical picture resembles very much that which is seen in fatal burn cases in which there is much tissue destruction, and with this analogy in mind, Taylor believes that much of the toxic manifestations seen in gas gangrene can be directly attributed to the poisons developed from the destroyed and gangrenous tissues.

In Taylor's experience 70 per cent of all wounds, as seen at a general military hospital, harbor the gas organisms and are potentially infected. This is followed by a stage in which the infectious process actually develops and is characterized by the production of gas which is retained under a constantly increasing pressure, until the tissues are dry and anæmic. Gas gangrene is now present. According to Taylor the gangrene results from mechanical conditions.

Wallace takes a middle path and believes that there is truth in both of these theories. There are three paths of infection: (1) direct extension; anatomical appearances do not seem to favor this mode of spread and it is very rare for direct extension to occur to intact muscles. The appearances of the fascial planes do not suggest them as furnishing the paths of infection; (2) along the inside of blood-vessels just before or after the circulation has ceased, the organisms gaining entrance by the open ends of vessels in compromised territory; proof of this was furnished by Dunn who found Welch bacilli in clotted brain vessels after a wound of the carotid artery; (3) systemic infection. Cases have been reported in which gas infection has occurred at a distance from the primary wound, in saline injection areas, or in areas at a distance which have been subjected to pressure. Wallace believes that the toxins must play some rôle inasmuch as it is difficult to account for similar microscopical pictures when there are few or many bacilli, or little or extensive distention of the tissues with gas. He does not appear to be certain as to the source of the toxin.

Lately some experiments of Bull and Pritchett have seemed to lend additional weight to the theory of D'Este Emery. Experiments with culture filtrates have shown that bacillus aerogenes capsulatus excretes a toxin of high potency. The toxin produces effects of two kinds: (1) hæmolysis; and (2) inflammation and necrosis of muscles and subcutaneous tissues. Bull and Pritchett believe that gas gangrene is a local process with a general intoxication, the toxins resulting from the growth of the organisms. These experiments are corroborated by the results Bull and Pritchett obtained from the exhibition of the antitoxic serum which they have elaborated.

CLINICAL FORMS OF THE DISEASE

1. *The classical form of the disease.* The best description of this form was given by Fauntelroy. The first stage combines the injury, plus the driving in of foreign material which results in the infection and localized necrosis, and is usually

accompanied by more or less shock. As soon as necrosis appears it is fairly certain that invasion by organisms has begun. The prodromal symptoms are those of the initial shock and sapræmia.

Within ten to thirty hours after the injury the temperature rises one or two degrees; the pulse becomes more rapid. There is slight headache, malaise, anorexia, and moderate thirst. A splint on the part eliminates the pain. In these early stages there is little beyond the nature of the wound to indicate the gravity of the condition. Within the next day or two there is a small degree of swelling, gas develops in the tissues which lose some of their elasticity. A progressive brownish-coppery mottling of the skin appears and with it a characteristic fetid odor is noted. Crops of blebs, varying in size from that of a pea to several inches in diameter, develop. The fluid in the blebs is straw-colored or sanguinolent, frequently contains staphylococci and very rarely perfringens bacilli. The discharge from the wound is thin and sanguinous, and contains typical bacilli.

The symptoms bear a direct relation to the size and situation of the wound, to the amount of trauma, to the time elapsing before treatment is instituted, and to the kind of treatment. The process may extend to the trunk from any one of the extremities.

The second stage is noted by the progressive gas production. The circulation becomes disturbed and there is a progressive weakening of the pulse. The grade of the infection usually begins to appear at the end of forty-eight hours. The temperatures range to 104° or 105° and the pulse runs up out of all proportion with the temperature. The discharge is now characteristic. There is marked crackling in the tissues. The brownish-coppery color continues to spread, the tissues are more and more indurated, and there are decided circulatory changes.

Generally, there is marked headache, anorexia and a constant restlessness. The facies are dull and stupid. All of these symptoms are progressive and last from one to three days. Toward the end of this period the virulence of the infection seems to increase.

The final stage begins insidiously with a deepening of the stupor which is followed by a rapid overwhelming of the system with the manifestations of a grave blood infection. Occasionally there is a "typhoid" state with coma vigil, carphologia, and a steady decline of heart and respiration. The end frequently comes very suddenly.

The postmortem examination shows the usual "foamy" organs described by Welch. The vessels are full of gas bubbles and it is thought that the sudden death is caused by gas embolism of the heart and great vessels.

2. *Toxic and œdematous forms.* Some of the cases develop a profound toxæmia and the whole course of the illness takes comparatively few hours. In other cases it is difficult to believe that the enormous œdema, with little or no crackling, is not an erysipelas.

3. *Mixed forms.*

4. *Localized gas abscesses.* These are said to be due to mixed infections.

5. *Superficial and deep gas phlegmons.* These may be very serious.

6. *Chronic and latent infections.* Cases of gas infection can develop a long time after the reception of the injury and when the wound is apparently in good condition and healing. An infection which has once subsided may flare up suddenly after a secondary operation is performed.

7. *Gas septicæmia and pyæmia.*

BLOOD CULTURES IN GAS INFECTIONS

For this purpose, Anderson and Richardson were able to classify the cases of gas gangrene in the following types: (a) a fulminating type with a rapidly spreading gas gangrene, hyperpyrexia, profound toxæmia, and terminal septicæmia; the bacillus of Welch was recovered from the blood in one of four cases; (b) a fulminating type without local gas formation and with subnormal temperature; only one case of this kind was encountered, this form being very uncommon; no blood culture study was, unfortunately, made; (c) a mild type with gas formation, mild constitutional symptoms, and, as a rule, a favorable issue. There were four cases of this type in the series reported and the gas bacillus was found in the blood of all four. All recovered except one; the latter died of a complicating tetanus infection. "Such patients appear to be rarely in a serious condition, certainly never so ill as to lead one to suspect the true clinical character of the disease." The foul wound presents all the usual characteristics of one thoroughly infected with the usually found group of organisms, bacillus perfringens, bacillus œdematis maligni, bacillus Hibler IX, bacillus pyocyaneus, streptococci and staphylococci; and there is marked reaction in the surrounding parts with pain, œdema and slight crepitation. There is a moderate irregular temperature. The skin is dry and of a dirty yellow color and there is a subicteric tint to the conjunctivæ. Mentally the patients are "heavy, stupid, and somnolent." This torpid state con-

tinues until the blood is sterile. Meanwhile the healing goes on undisturbed.

Anderson and Richardson point out that such a mild condition would escape notice. They have frequently seen the establishment of a similar clinical state during the acute stage of a wound which lasted for a day or two and subsided; these periods were coincident with a recrudesence of infection. It is highly probable that the method of production of metastatic foci of gas gangrene at a distance from the primary wound reported by Taylor and others finds its explanation in these temporary states of bacteræmia.

THE X-RAY

Lardennois and Pech obtained some interesting facts by studying with the X-ray limbs which had become gangrenous. A normal limb shows (control observations) a homgeneous gray shadow of the musculature surrounding the central bony skeleton. A limb in which an ordinary inflammation is going on shows a picture similar to the first except that the limb is swollen and the outlines of the muscles are somewhat more distinct.

A limb in which gas gangrene is taking place gives distinct pictures which depend on the stage of the process. In the beginning a light area corresponding to the destroyed tissues surrounds the missile track. Later the individual muscles which are affected become visible by an irregular spotting and striation. As the muscles are more extensively destroyed, the clear spaces become larger and are present in moderate numbers. A characteristic appearance is obtained.

In a limb which is gangrenous without gas formation, almost normal pictures are seen.

COMPLICATIONS

The most important complication, and the one to be feared most, is tetanus. According to Weinberg and Seguin, this complication occurs in 13 per cent of the cases.

PROGNOSIS

This is judged by the following criteria:

1. The character and extent of the injury. Deep, narrow, destructive wounds give a grave outlook.
2. The involvement of the main vessels (massive gangrene).
3. The pulpification of the tissues.
4. The length of the interval before proper treatment is afforded. This is the most important factor.
5. The stage of the process and the virulence of the infection.

TREATMENT

In a military environment, Fauntelroy recommends certain prophylactic measures such as: (1) covering the trench floor with faggots; (2) treating the trench walls with slaked lime; (3) providing uniforms manufactured from hard finished cloth; (4) encouraging personal cleanliness by the soldier. If the soldiers reach the surgeons' hands within the first twelve hours after being wounded, an attempt at an abortive treatment should be made. This comprises the steps enumerated below, carried out, if that be possible, even more thoroughly than indicated.

Whenever circumstances warrant, and this is paramountly so in the injuries of the present war, every wound should be treated with suspicion and should be regarded as potentially infected with gas organisms. The corollary is obvious and implies first aid as soon as possible after reception of the injury. Immediate and thorough cleansing, with and without antiseptics, and the removal of every variety of foreign body, in the opinion of Leriche, will accomplish a cure with no, or little, suppuration, provided it is done reasonably soon.

The absolutely essential steps in this all-important primary procedure include: (a) the opening up completely of the entire wound including all pockets; (b) the removal of all dirt and the mechanical cleansing of the wound; (c) the removal of all foreign bodies; (d) the eradication of all hæmatomata, small and large; (e) the removal of all muscle tissue which is in any way compromised; (f) complete hæmostasis.

Nacciarone makes as many incisions in the long axis of the limb as are found necessary and deepens these between the muscles down to the bone. The territory compromised is delimited with the cautery, and thereafter he irrigates the parts with iodine solution. A number of tubes are inserted for drainage. The irrigations are repeated from one to three times in the first twenty-four hours. When it was possible to carry out this procedure in the first six hours, 90 per cent of the cases were cured; in the first twelve hours, 88 per cent were cured.

If there is much distention of the limb causing an increased intramuscular pressure, the number of incisions made must be adequate to relieve this thoroughly before it has had time to cause gangrene. It is important to find the hidden hæmatoma or necrotic area from which the gas is being formed. The degree of distention is frequently so marked that the large incisions are immediately closed by the protrusion forward of the swollen

muscle bundles and some mechanical aid must be utilized to keep the incisions open.

Wallace points out that it is essential to avoid all pressure or other impediment to the circulation. If there is involvement of the main vessel of the limb, all attempts to restore the continuity of the blood stream must first be made before ligation is considered.

In excising the wound track, a method which is very popular at present, it suffices to remove the toxic and gangrenous tissues with the whole zone of infection. Realizing that the process is almost invariably limited to within the muscle sheath, Frankau, Drummond and Neligan have recommended resection of the single muscle or muscle group which is involved. This is possible only when the main vessel of the limb is intact, and is contra-indicated when the result would yield a useless limb.

In dealing with bone wounds, it is expedient to remove all bone fragments, those that are loose, or are thoroughly ground with dirt and other foreign matter, as well as those which have periosteal attachments which under ordinary circumstances one would be tempted to leave, inasmuch as, in the presence of infection with gas organisms, they might cause trouble later on. In any of the operative procedures outlined here, the use of a constrictor is contra-indicated; it may lead to a rapid spread of infection.

It is imperative to institute wide and abundant drainage; and it has been found of great advantage to introduce some method of chemical and mechanical sterilization. Irrigation of the wounds is preferred, and Dakin's solution, applied after the method of Carrel, is the antiseptic of choice. In the after-care of these wounds special attention should be given to insuring for the wound surfaces a maximum amount of fresh air and sunshine. All of the authors comment on the value of these agents in hastening the healing. The injection of oxygen into the tissues is regarded as being not beneficial and by some men as being harmful.

In a general way the question of amputation is to a great degree decided by the general surgical judgment of the surgeon. This is especially so in late amputations. Immediate amputation is indicated as a life-saving measure in the hyperacute and rapidly spreading cases; in massive gangrene with, and sometimes without, blocking of the main vessel; and where the local resection of the compromised territory would yield a useless limb functionally. In the latter case, however, amputation would be contra-indicated if the patient's general condition would not justify the extra hazard. Wallace points out that the extent of the skin crepitation is no indication of the necessity of amputation. It need not correspond with a sufficiently severe subcutaneous condition that would require amputation. It is necessary to actually inspect the whole of the involved area before making the decision.

The technique of amputation for gas gangrene is distinguished by the avoidance of any suturing of the resulting stump. If flaps are made, they are left wide open. The French surgeons have strongly advised a "flush" amputation, in which skin, fascia, muscles, and bone are divided on the same plane. It is frequently possible to avoid secondary operations for the closure of the wound, resulting from the latter type of operation, by the judicious use of various traction apparatuses applied to the skin. Frequently, too, the extension of the process beyond the plane of amputation on the proximal side makes necessary various lateral incisions in the stump, with the object of obtaining more ample drainage.

SERUM TREATMENT

A number of sera have been prepared which have been employed in gas infections. At the beginning of the war, Weinberg and Seguin elaborated an antitoxic serum against bacillus perfringens. It showed some good results but was not entirely satisfactory and the belief was expressed that polyvalent serum, prepared with all of the organisms commonly encountered in the wounds, would probably be more efficacious. Sera have also been prepared against bacillus œdematiens and against the vibrion septique.

Laclainche and Vallee made a polyvalent serum for use, especially in wounds containing streptococci. It showed some good results, according to Quénu, Bazy and Routier, in counteracting the secondary flaring up of a gas infection which sometimes occurs after a late amputation.

In the earlier part of this review some experiments of Bull and Pritchett were mentioned, who discussed the toxins in the filtrate of cultures of Welch bacilli. An antitoxin has also been prepared, in a manner similar to that in which the diphtheria antitoxin is made. In animals the protective qualities of Bull and Pritchett's antitoxin were marked and would neutralize the gas toxins in a manner very comparable in its efficiency to that of diphtheria antitoxin. A serum prepared of any one strain seems efficacious against all other strains. At the present writing this antitoxic serum seems to be the best of all so far prepared.

RESULTS

Of 464 cases of gas infection, 42 were fatal; 25 died from gangrene, 4 died from tetanus, and the rest from the severe injuries which they had sustained. When the gangrene was limited to a group of muscles, it was possible in 41 cases to do a local excision; of these 33 recovered. Amputation by the open method and with lateral skin incisions was practiced 65 times; 48 of these recovered. These are the results published by Ivens. Zindel reported that the mortality of gas infection in military wounds varied from 12 to 53 per cent, in contradistinction to a mortality of 70 to 90 per cent in gas infections following civil injuries.

BIBLIOGRAPHY

1. Anderson and Richardson. Brit. J. Surg., 1918, v, 393.
2. Bashford. Brit. J. Surg., 1916, 1917, iv, 433, 562.
3. Boggio. Policlin., Roma, 1917, xxiv, 669.
4. Bowlby and Wallace. Brit. M. J., 1917, i, 705.
5. Bull and Pritchett. J. Exp. Med., 1917, xxvi, 119, 603, 867.
6. Chalier. Presse méd., Par., 1917, xxv, 390.
7. D'Este Emery. Lancet, Lond., 1916, cxc, 948.
8. Douglas, Fleming and Colebrook. Lancet, Lond., 1917, cxcii, 604.
9. Fauntelroy. Ann. Surg., Phila., 1916, lxiii, 1.
10. Frankau, Drummond and Neligan. Brit. M. J., 1917, i, 729.
11. Fraenkel. Centralbl. f. Bakteriol., 1893, xiii, 13.
12. Hartley. Brit. M. J., 1917, i, 481.
13. Heitz-Boyer. Arch. de méd. et pharm. mil., Par., 1917, March.
14. Ivens. Lancet, Lond., 1916, cxci, 1058.
15. Laclainche and Valee. Arch. de méd. et pharm. mil., Par., 1917, March.
16. Lansini. Policlin., Roma, 1917, xxiv, 609.
17. Lardennois and Pech. J. de radiol. et d'electrologie, 1917, May, June.
18. Leriche. Lyon chirurg., 1916, xiii, 35.
19. Maisonneuve. Gaz. méd. de Par., 1853, p. 592.
20. McNee, Dunn and Shaw. Brit. M. J., 1917, i, 727.
21. Mullaly and McNee. Brit. M. J., 1916, i, 478.
22. Nacciarone. Riforma med., Napoli, 1917, xxxiii, 772, 790.
23. Pirogoff. Grundzuge der allgemeinen Kriegeschirurgie, Leipzig, 1864, p. 867, 1007.
24. Rev. War Med. and Surg., 1918, i, 17.
25. Sacquéfée, Quénu, and others. Bull. et mém. Soc. de chir. de Par., 1915, June 1.
26. Speed. J. Am. M. Ass., 1918, lxx, 225.
27. Taylor. Lancet, Lond., 1916, cxc, 123.
28. Idem. Bull. Johns Hopkins Hosp., 1916, xxvii, 297.
29. Thies. Brun's Kriegeschirurgie, 1916, p. 595.
30. Wallace. Brit. M. J., 1916, ii, 381.
31. Idem. J. Roy. Army M. Corps, 1917, xxviii, 528.
32. Idem. Brit. M. J., 1917, i, 725.
33. Weinberg. Proc. Roy. Soc. Med., 1916, ix, 119.
34. Weinberg and Seguin. Ann. de l'Inst. Pasteur, Par., 1917, xxxi, 442.
35. Welch. Communicat. Massachusetts M. Soc., 1898–1901, xviii, 253.
36. Welch and Nuttal. Bull. Johns Hopkins Hosp., 1892, iii, 81.
37. Zindel. Brun's Kriegeschirurgie, 1916, p. 257.

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Fiolle, J., and Delmas, J.: Exposure of Deep Vessels by Wide Routes of Access (Découverte des vaisseaux profonds par des voies d'accès larges). Paris: Masson et Cie., 1917.

The preface of this work was written by Pierre Duval, whose wide experience in the surgery of the present war renders his opinion of the highest value. The authors disclaim any attempt to modify the classical procedures of arterial ligation. They state that the admirable work of Faraboeuf has laid down the principles of ligation of a healthy vessel in healthy tissues, and that his procedures and technique will forever remain the methods of choice for the exposure of a given vessel, for the hæmostatic ligature preliminary to the first stage of any operation, and for the permanent ligation in the indirect cure of an arterial aneurism.

But wounds of war have shown the necessity of a new vascular surgery. From their experience the authors describe the usual intervention in a vascular war wound. The limb is infiltrated with blood and it is impossible to know which vessel has been injured. Often the situation is perilous; the hæmorrhage has been serious, arrested by a tourniquet. Using the classical methods, how is one to know which incision to choose so as to avoid exposing the wrong vessel, or if the wound has involved two vascular trunks, to escape leaving one unexplored with fatal result?

Under these conditions they show the surgeon working in the bleeding region, but seeing nothing. One, two, several clamps are applied at random, and the hæmorrhage continues. Boldly a clamp is applied to the whole mass. The blood no longer flows but the blind clamp has grasped everything at once, both the bleeding vessel and others which are not involved; sometimes also a nerve which will suffer for a long time from their crushing, even though it be temporary. The victory has cost too dear.

The scrupulous care of Delmas and Fiolle has incited them to look for methods which, by a wide view of the deep vessels of the limbs, allow direct examination of the vascular trunks through a great length, a clear view of all the vessels which in one region can together or separately be injured by a war wound. The authors will certainly be criticized both for the length of the incisions and the section of certain muscles. But it must not be forgotten that in present war surgery the immediate reconstruction of all the anatomic planes cut by the wound or by the operation is the method of choice.

Delmas and Fiolle apply their procedures especially in war surgery. Duval states that he has employed them and that they are perfect, rapid, and permit a precise vascular surgery of which it can be said that nothing is added to the gravity of the vascular wound.

But this wide exposure of deep vessels is not applicable solely to war surgery. Modern vascular surgery demands new procedures, wide routes of access which facilitate the performance on the vessel of quite other operations than the simple passage of a ligature around a half centimeter of carefully isolated artery.

The procedures which these authors describe are, by the wide exposure of deep vessels, the basis of all present day vascular surgery.

The classical methods of ligation will always remain necessary both in the apprenticeship of all students of surgery and the procedures of choice for simple ligation of the vessels.

Vascular surgery requires broader routes of access; war surgery, by its imperative necessities, has been the occasion for giving them birth.

The operations described by the authors involve exposure of the following vessels: (1) posterior vessels of the leg in the region of the calf; (2) anterior vessels in the upper half of the leg; (3) first portion of the anterior tibial artery; (4) popliteal artery and its branches; (5) femoropopliteal trunk; (6) vascular trunks of the buttock; (7) vessels of the upper third of the forearm; (8) axillosubclavian trunk; (9) great trunks of the base of the neck and their intrathoracic course; (10) common carotid and internal jugular from the clavicle to the upper border of the thyroid cartilage; (11) great trunks of the neck from the upper border of the thyroid cartilage to the base of the skull.

Of these only a few examples will be briefly discussed in order to give an idea of the general principles involved.

Posterior vessels in the region of the calf, i.e., posterior tibial and peroneal. These vessels are deeply situated in the muscular masses of the leg; the classical incisions only expose one vessel at a time, and do not give a wide view. The authors' operation is briefly described as follows: With the anæsthetized patient lying prone, the incision (30 cm. long) begins two finger-breadths below the bend of the knee between the two heads of the gastrocnemius, 1 cm. within the median line; it descends at first vertically and then curves slightly inward to

embrace in its concavity the inner belly of the gastrocnemius, reaching the inner border of the tendo achillis which it follows to 2 cm. above its insertion, equidistant from the tendon and the internal malloleus. The external saphenous vein and nerve are exposed by the incisions. They are quickly drawn to the outer side. The nerve is an excellent guide to the interspace between the two heads of the gastrocnemius. The superficial fascia at the inner edge of the tendo achillis and parallel to the latter is cut.

The index finger is introduced into the opening and pushed in front of the tendon. The finger easily passes upward in the lax cellular tissue in front of the soleus, and will act as a guide for section of the muscles. The heads of the gastrocnemius are quickly separated, then the soleus is incised vertically through its middle, the index finger alone serving as a guide. The muscle should be split very widely in the direction of its fibers, the tendo achillis being divided into an internal and an external bundle.

The index finger is now withdrawn; the two muscular masses are separated by means of broad abdominal retractors. It is thus easy to see the posterior tibial nerve very white and voluminous, and close to it on the inner side the posterior tibial vessels; externally, about 1½ cm. from the nerve are seen the peroneal vessels. These structures may be traced for a distance of 8 or 10 cm., and any operation on them can be accurately performed.

Anatomical restoration is very simple, requiring only the approximation of the large muscular bundles with a few catgut sutures loosely applied, and the closing of the posterior fascia which gapes in places.

Arch of the anterior tibial artery. Origin from the popliteal, passage through the interosseous space. In the treatises on operative surgery, this high and deep portion of the anterior tibial is never considered. Faraboeuf simply remarks that ligation of the anterior tibial on the front of the leg becomes more difficult the higher it is attempted. This difficulty grows into an impossibility when the vessel is bleeding, especially in its passage through the interosseous space and in its short course on the posterior side of the bones. It describes a true arch in this region, running anteroposteriorly around the free margin of the interosseous septum.

Ordinarily, lesions of the vessel in this region are treated by ligation of the popliteal above and the anterior tibial below. This is a serious operation, carrying danger of gangrene, while the operation of the authors conserves the vitality of the limb.

In the authors' operation, the patient lies prone, the lower limb slightly flexed, abducted and externally rotated so that the inner surface of the knee and leg firmly rest on the table. A bayonet-shaped incision is made beginning 3 or 4 finger-breadths above the insertion of the tendon of the biceps into the head of the fibula and passing along the posterior edge of the tendon. Behind the neck of the fibula the incision crosses it diagonally and then descends straight on the external surface of this bone, to end midway between the head of the fibula and the external malleolus.

The superficial fascia of the thigh and leg is opened parallel to the cutaneous incision. The finger is then able to isolate the biceps above, the outer head of the gastrocnemius below and from behind forward, the tibial origin of the soleus and the peroneus longus. The external popliteal nerve is isolated and drawn outward. Perpendicularly to the direction of their fibers and 2 or 3 cm. from their upper insertions, the outer head of the gastrocnemius and the soleus are cleanly divided. This already gives a wide access to the lower part of the floor of the popliteal space. Already the termination of the popliteal vessels, the origin of the anterior tibial, peroneal and posterior tibial can be seen. But all of these structures are as yet deeply situated, accessible only to the end of the finger, separated from the operator by a rigid obstacle that must be removed, the fibula.

The external popliteal nerve being drawn well externally, the neck of the fibula is bared sufficiently to allow the passage of a Gigli saw but not enough to destroy the attachment of the peroneal muscles. The Gigli saw cuts the bone as high as possible. At the lower end of the skin incision, externally to the peroneus longus muscle and along the outer intermuscular septum a pedicle needle is passed down to and through the interosseous membrane, its point appearing posteriorly and carrying with it the end of a Gigli saw. The neighboring muscles are protected by retractors, and the fibula is quickly cut at this new point, without any risk of injury to the external popliteal nerve and its terminal branches, which have been previously isolated and drawn aside. The attachments of the peroneus longus, carefully preserved as far as possible, will assure the vitality of the fragment of fibula liberated by the two saw cuts.

The fragment must now be freed so that it can be swung downward. It is held now only on its inner border by the very resistant interosseous membrane. This is put on the stretch by seizing the upper end of the fragment with the fingers of the left hand, or better, with Faraboeuf's forceps, and drawn vigorously outward. The membrane is cut level with its insertion, permitting the fragment to be swung downward, rendering all parts of the operative field and the vessels widely accessible for any operation.

In spite of the number of stages described, nothing truly mutilating has been done. The two portions of the divided soleus and of the external head of the gastrocnemius are reunited end to end with a few catgut sutures. The fragment of the fibula is then put back in place. Below, bony coaptation is assured by the periosteum of the external surface. Above, suture of the cut fibers of the peroneus longus fixes the fragment in position. The superficial fascia is sutured, especially above, so that the sciatic nerve shall be well kept in place in its tract behind

the biceps tendon. The skin is closed with horsehair. If drainage is indicated, it is easily obtained by a tube left under the soleus and emerging through the lower end of the skin incision. It is well to maintain for a few days the leg flexed on the thigh and the foot extended on the leg in order to relax the sutured muscles.

Vascular trunks of the buttock. Hæmorrhage from these vessels may be very severe; in war surgery, gluteal hæmatoma has acquired a just reputation for gravity, due not only to the abundance of the loss of blood, but due also to the difficulty of hæmostasis.

The groups of vessels to be considered here are three in number, namely, the gluteal, sciatic, and internal pudic. The causes of difficulty in dealing with hæmorrhage from these vessels are:

1. The vessels are deeply situated under the thick mass of the gluteus maximus.

2. The classical incisions, separate for each artery, are quite inadequate.

3. There is not only one vascular group but three, and it is impossible to know, when a wounded buttock is distended with blood, which is the injured trunk.

The classical incisions give access to only one or two arteries, and moreover present great difficulties owing to passage through the gluteus maximus. The authors' technique permits a wide exposure of all the vessels of the region, without section of the muscle.

The patient is placed in the prone position, the affected side being slightly raised by a folded towel under the hip. The incision begins at the middle of the external surface of the great trochanter, three finger-breadths below its upper border. It passes vertically upward to 2 cm. above the trochanter, then curves slightly upward, inward and backward, to within 2 cm. of the posterior superior spine of the ilium. The thick fatty tissue thus exposed is cut through down to the aponeurosis of the gluteus maximus and in the direction of the fibers of the latter.

The vessels are situated between the gluteus maximus behind, the gluteus medius, the pyriformis, the obturator internus and the gemelli in front. The space in which they are found is filled with very lax cellular tissue, which allows an easy separation of the muscles. To reach this space, at the lower part of the incision, the aponeurosis over the great trochanter is cut vertically, the index finger is inserted into the opening and passed over the posterior surface of the trochanter, then directed upward and inward. Without any difficulty it penetrates beneath the gluteus maximus, the muscle planes separating easily, until the great sciatic notch can be felt. The outer border of the gluteus maximus is marked by a white line of fascia where it overlaps the gluteus medius. This line of fascia is cut with scissors upward as far as the crest of the ilium. A broad retractor may now be passed beneath the gluteus maximus, drawing it backward and inward. The whole vascular region appears, completely exposed.

Anatomical restoration is brought about by simply returning the gluteus maximus to its normal position, and holding it there with a few sutures passed through the fascia.

Great trunks of the base of the neck and their intrathoracic course. On the right are the superior vena cava, innominate vein, innominate artery and its bifurcation. On the left are the innominate vein, common carotid and subclavian arteries.

Aneurisms of the arterial trunks arising from the arch of the aorta are quite common. Distal ligation is generally insufficient. Double ligation, proximal and distal, is preferable, but only gives truly good results when accompanied by extirpation of the sac. In spite of the relative protection afforded by the sterno-costo-clavicular breastplate, the great vessels of the base of the neck are not infrequently wounded. Generally under such conditions there will be present a diffuse arterial or arteriovenous hæmatoma in the region of the superior mediastinum and base of the neck. Intervention is absolutely necessary to close the vessel wound, whatever its situation, if fatal secondary hæmorrhage is to be prevented.

The operative technique of Pierre Duval, first described in 1910, is employed. The patient lies on his back with a pillow between the shoulders. The incision begins exactly in the median line at the junction of the manubrium with the body of the sternum, ascends vertically to the suprasternal notch, passing down to the bone. The incision curves outwardly parallel with the upper border of the clavicle a finger-breadth above the latter, terminating externally about the middle of the clavicle. The sternal and clavicular heads of the sterno-cleido-mastoid muscle are severed just far enough from their insertions to allow suture of the stumps at the end of the operation. The sterno-hyoid and sterno-thyroid muscles are likewise cut through, after passing a grooved director beneath them.

The clavicle is bared at about its middle and cut through with a Gigli saw. With chisel and mallet a vertical section of the sternum is made in the median line from the sternal notch to the upper border of the second costal cartilage. At the lower end of this section a second transverse cut is made toward the side involved. The angular flap thus made has now no other skeletal attachment than through the cartilage of the first rib. This is exposed and cut through as far as possible from the sternum in order to pass externally if possible to the powerful costoclavicular ligament. This maneuver can only be done through the fibers of the pectoralis major. The angular flap, now attached only by skin and muscles and consisting of the inner half of the clavicle, half the manubrium and the first costal cartilage, is swung carefully and slowly downward and outward, its deep surface being freed from any intrathoracic structures which may be adherent

to it. Thus, above, the large innominate venous trunk, fixed to the clavicle by the middle cervical fascia, and below, the pleural dome, must be carefully liberated. The great vessels are thus exposed, differing according to which side is opened.

Reconstruction of the region is easily achieved to give a functionally perfect result. It is divided into four stages: (1) replacement of the osteomuscular flap; (2) fixation of clavicle and sternum with wires at sites of section; (3) reunion of severed muscles with catgut sutures; (4) horsehair sutures for the skin.

Common carotid and internal jugular from the clavicle to the upper border of the thyroid cartilage. No exposure is easier, in the laboratory, than that of the internal jugular and the common carotid. But in actual practice, this classical method has only one application, i.e., exposure of vessels known in advance to be intact. Some of the commonest conditions requiring an operation on these vessels are recent wounds, rendering dissection very difficult or impossible, owing to the free hæmorrhage, aneurisms of various kinds, and dissection of cervical glands.

The classical incision is inadequate, and the obstacle to wide exposure of the vessels is the thick, almost immovable mass of the sterno-cleido-mastoid muscle, which covers the carotid sheath. The authors' operation consists essentially in section of this muscle with the least damage possible, and permitting a complete repair. With a folded towel between the shoulders and the face turned toward the opposite side, the incision is made from the tip of the mastoid to the sternal insertion of the sterno-cleido-mastoid muscle in the groove between the muscle and the larynx and trachea. The incision at its lower end turns abruptly and follows the upper border of the clavicle to the middle of that bone, just short of the external jugular vein. Through the entire length of the vertical incision the platysma and deep fascia are split, over the anterior border of the sterno-cleido-mastoid.

The finger is passed beneath the muscle, which is stripped throughout its entire length. The sternal head of the muscle is well isolated with the finger beneath it, and cut through with scissors 1 cm. above its insertion. The clavicular insertion of the muscle is detached in the same way after passing the finger beneath it. After freeing the muscle from its remaining attachments throughout its entire length, it is thrown backward with the overlying skin. It is not necessary to incise the underlying omo-hyoid muscle, which can be drawn either upward or downward as the case demands. The carotid vessels in their sheath can now be readily isolated by blunt dissection.

Anatomical restoration is now brought about by returning the musculocutaneous flap to its place, the two heads of the muscle being fastened with a few sutures.

The great trunks of the neck, from the upper border of the thyroid cartilage to the base of the skull. These are the internal carotid, external carotid and its branches, and the internal jugular.

The same reasons for wide exposure of the vessels in the upper part of the neck apply as in the lower part. The obstacles to wide access here are not only the sternomastoid muscle, but also the posterior belly of the digastric. The angle of the jaw, the mastoid process and the lateral tubercle of the atlas also cause great inconvenience. The operation described has for principle the backward retraction of an osteo-musculo-cutaneous flap, comprising the tip of the mastoid, the sterno-cleido-mastoid muscle and the corresponding skin.

A pillow is placed beneath the shoulders, the head being turned to the opposite side. The incision begins a few millimeters behind the base of the mastoid process and curves forward toward the ear to embrace in its concavity all the lower portion of the mastoid process. From the postauricular groove it descends obliquely down the neck, following the anterior border of the sterno-cleido-mastoid, terminating 3 cm. below the upper border of the thyroid cartilage. The external jugular vein is cut between two clamps and tied. All soft tissues are dissected from the mastoid process except the insertion of the fibers of the sterno-cleido-mastoid.

The tip of the process with the muscular fibers inserted is now detached either with a chisel and mallet or a Gigli saw passed beneath the muscle. Care must be taken not to injure the facial nerve. The mastoid tip with the muscle inserted is now swung backward. Beneath is seen an almost transverse fleshy mass emerging behind the mastoid process and passing beneath the ascending ramus of the mandible. This is the posterior belly of the digastric, which hides the vascular sheath in this region. This muscle is isolated, detached from the deep plane, and carefully sectioned perpendicularly to its fibers. By blunt dissection the various vessels and nerves of the region can now be isolated.

In restoring the parts to normal, the digastric is reunited with two catgut sutures. The detached mastoid tip is replaced and fixed by a few sutures through the periosteum and overlying fibrous tissue.

These various procedures are well illustrated throughout by H. Beaufour. R. H. Ivy.

Cannon, W. B., Fraser, J., and Cowell, E. M.: The Preventive Treatment of Wound Shock. *J. Am. M. Ass.*, 1918, lxx, 618.

In previous papers of this series, evidence has been afforded, among others, on the following points:

1. Cooling of a person in shock is attended by a further lowering of an already low blood-pressure or by continuance of the pressure at a low level.

2. Surgical operation performed on a person in shock is accompanied by a rapid and large increase of an acidosis which is already present, and by a correspondingly sudden and extensive fall in an existent low arterial pressure.

In the following account are presented suggestions based on preceding papers for the prevention and early treatment of wound shock and for the preparation of the wounded man for surgical operation.

To send blankets to all parts of the line is impossible, but by the adoption of a waterproof sheet-blanket "packet" system a stretcher prepared for use is provided with means for preventing excessive loss of body heat.

All regimental stretchers at advanced bearer posts in the front line and stretchers carried by working parties should be equipped with this packet. The wounded man should be guarded as much as possible against loss of heat. Efficient first aid should be given rapidly without unduly exposing the patient to the cold for a prolonged period. A hot drink should be given at the earliest possible moment. Then, having been carefully wrapped up, the patient should be carried down with all speed to the regimental aid post. A well trained, intelligent orderly might be entrusted to give a tablet of morphine (one-fourth of a grain) by mouth in cases of severe pain.

As soon as the patient arrives at the regimental aid post he should be given a few ounces of hot drink, and his wet boots and puttees removed, along with any other clothing which may cover wounds. Meanwhile the dry stretcher is prepared by arranging the first two blankets so that four folds will come underneath the patient. The blankets are covered temporarily with a water-proof sheet to prevent soiling while wounds are being dressed. The man is now transferred to this prepared stretcher which is supported on trestles and stands well over the stove. The third or free fold of each of the lower two blankets hangs down on either side and helps to form an enclosed warming chamber. If there is no constant source of heat, a hot air chamber may be made in a few minutes by use of a Primus or Beatrice stove.

The patient is now becoming warmed, while the medical officer is attending to the surgical cleansing of the wounds and neighboring parts, and is applying proper dressings and splints. As soon as the dressings are finished, well guarded hot water bottles are placed in each axilla and a third across the loins or between the legs; and the third blanket, which is doubled lengthwise, is laid over the patient. The two warmed blankets which have been hanging to form the sides of the hot air chamber are lifted, carried over the patient and tucked in.

Finally, just before the patient is sent off, he is given a hot drink of sweetened tea in which a dram of sodium bicarbonate is dissolved.

At the advanced dressing station the sweetened alkaline drink and warming process with the Primus stove may be repeated.

The next stage of the journey is usually undertaken by means of some mechanical transport, such as a narrow gauge railway or a motor ambulance. The cars are at present warmed, so that there is a lessened chance of loss of body heat on the final stages of the journey.

At the clearing station, application of warmth should be emphasized as the most important part of the treatment in all serious cases.

Whereas the appearance and degree of primary wound shock depend on the degree of damage done to a vital organ, secondary wound shock is proportionate to the length of time the pernicious factors are allowed to work; in other words, to the period when the wounded man is "lying out."

In the rush of dealing with large numbers, it will be impossible in the line to attend to all the details described above. Large drafts of hot sweet tea made alkaline with sodium bicarbonate can, however, be easily provided, and should be given whenever the shocked patient complains of thirst at the dressing station or at any other suitable point on the way down to the clearing station.

Evidence presented in an earlier paper showed that the acidosis which prevails in cases of low blood-pressure is associated with such sensitization of the body that surgical operation may result in a serious increase in the acidosis and a perilous sinking of the blood-pressure. The question as to the causal relation between low pressure and acidosis has been discussed, and it appears that the two conditions may interact, each contributing to the development of the other.

Under these circumstances, advantage would be gained by protection against each of the conditions: first, against the development of the sensitizing acidosis; and secondly, against the increase of acidosis and the further fall of blood-pressure which occur at operation.

The results obtained by others show that by administration of sodium bicarbonate, the alkaline reserves of the body can be greatly increased even in unfavorable circumstances. Since acidosis develops in shock and involves a definite risk when operation is undertaken, its avoidance should be sought. The recommendation is offered that wounded men be provided with a warm drink containing a dram or four grains of sodium bicarbonate at suitable relay posts on their way from the front to casualty clearing stations, as previously indicated.

The authors cite six cases, among others, which show that an alkaline injection at the start of anæsthesia prevents the dangerous depressive effects which the anæsthetic and operative procedures have in cases of shock with acidosis. The operation ends, not with an increase of the existent acidosis, but with the acidosis overcome and a normal alkaline reserve provided. And the blood-pressure, instead of being perilously lowered, is actually raised during the critical period. The blood-pressure may fall to some extent later, but the improved state of the patient during operation is unmistakable, and the subsequent course of shock cases in which operation has been performed with the precautions described above has been highly gratifying. E. C. Robitshek.

ASEPTIC AND ANTISEPTIC SURGERY

Fiessinger, N., and Clogne, R.: Biological Study of the Action of Alkaline Hypochlorites in the Treatment of War Wounds (Etude biologique sur l'action des hypochlorites alcalins en solution dans le traitement des plaies de guerre). *Rev. de chir.*, Par., 1917, liii, 264.

The authors remark that the Carrel method of treating wounds has arrived at that stage when the facts can be viewed with a certain amount of perspective. The clinical facts show incontestable successes, which fully justify its employment. But regarding the deductions from the application of this method, especially the idea that Dakin's fluid acts as an energetic sterilizer in war wounds, the authors disagree. In this article they demonstrate that in ear wounds hypochlorites in the dosage actually employed at present have only a very slight sterilizing action, but that they act energetically as chemical cleansing agents by proteolysis.

The authors have made a number of bacteriological and chemical studies, of which they give the details. In general they find that a wound remains the site of an anaerobic infection so long as any mortifying tissue remains in it, and of a more or less aerobic infection as long as any exudation whatever remains, in spite of continuous Carrel irrigation. A wound irrigated by the Carrel method preserves a microbic septicity, the character of which varies according to the perfection of the chemical purification; but that no direct germicidal action truly exists.

The authors' experiments have shown them that *in vitro* unquestionably hypochlorites have an antiseptic action; but it is otherwise in the presence of liquids or solid albumins. Hypochlorites decompose in the presence of proteins and they only act on living microbic elements, either by their great abundance or because the small quantity of albumin present leaves enough non-decomposed hypochlorites free to act.

The excellent appearance of a wound and the facility of its early secondary suture when treated by the Carrel method cannot, according to the authors, be attributed to any particular sterilizing action, but rather to a combination of favorable chemical actions, especially to the proteolytic action of the hypochlorites. A series of experiments along these lines brings them to the view that the action of alkaline hypochlorites on albumin may be thus summarized: A hypochlorite is decomposed by contact with albumin; the chlorine combines with a certain part of the proteins and gives rise to chloramines; oxidation phenomena follow. The sum total of these complex actions is a dissociation of the albuminoid molecule into albumoses, peptones and still simpler products. There is in fact a proteolysis of chemical origin. This rapid dissociation of hypochlorites in the presence of albumin explains the exhaustion of their antiseptic action. A constant renewal is necessary in practice. The cleansing of the wound is however not due to any anti-microbic action.

The general conclusions drawn by the authors from their study are:

1. Dakin's fluid has in reality only a weak germicidal power which is lowered according as the sphere of operation increases in albumin contents.

2. At the muscular surface and in war wounds, continuous Dakin irrigation does not effect sterilization in the doses actually employed.

3. The improvement of wounds by the Carrel treatment is due to its proteolyzing action rather than to its sterilizing action. W. A. BRENNAN.

Taylor, W. H., and Taylor, N. B.: Liquid-Tight Closure and the Treatment of Wounds. *Lancet*, Lond., 1918, cxciv, 671.

In the *Lancet* of September 22, 1917, a device was described for water-tight irrigation of wounds. This device as improved is described and illustrated in this article. It is a rubber contrivance which is held in position by a roller or many-tailed bandage. There is an outlet and an inlet for irrigation purposes. There are lips of rubber at the upper and lower ends of the device which, when the appliance is filled with liquid, make it water-tight. No drainage tubes are used in the wound but small wire "cages" are used to spread it. The center of the device coincides roughly with the center of the wound and the bandage applied.

An irrigator holding three to six quarts is used with one-fourth of an inch tube connection. The outflow tube is larger and has a pinch-off attachment. The pressure is regulated by the height of the irrigator. The elevation is slight (6 inches) in the acute cases and where there is much discharge. The highest elevation is about eighteen inches. As much as three feet elevation has been used without untoward effects. In the use of negative pressure more care must be exercised. Freedom from pain is the best criterion as to the amount of negative pressure to use. Five per cent saline at 115° F. is used as an irrigation solution.

The results may be noted as follows:

1. Rapid softening of indurated tissues and return to normal color.

2. Disappearance, often within twenty-four hours, of the swelling.

3. Profuse discharge of pus for the first twelve hours, and rapid diminution afterward, the secretion becoming seropurulent, then lymphoid in character.

4. On an average, in chronic cases, the wound is cleansed of pus in thirty-six hours; i.e., pus is removed as soon as formed.

5. Granulations become bright in color and bleed more readily. After four or five days if the device be removed, an old chronic sinus usually fills up with lymph and blood.

6. There is almost instant relief from boring pain which may have worried the patient for months.

7. The improvement in general health and morale of the patient incident to these local changes is often remarkable.

The following advantages, it is believed, are associated with this plan of treatment:

1. Penetration of the fluid to, and tidal evacuation of, distant loculi, resulting in thorough mechanical cleansing of the wound cavity.

2. Establishment during negative pressure of the outward flow of lymph with presumably its quota of bacteria.

3. Avoidance of large mutilating incisions required for evacuation of deep pockets and insertion of fluid-conducting tubes.

4. The concentration of antiseptic or hypertonic fluid remains constant, since the freedom of its delivery into the wound being unrestricted, the solution can be frequently renewed.

5. The ease with which the beneficial effects of heat on interior of the wound may be secured.

6. Elimination to a large extent of the personal equation.

7. Insurance of dry beds and a sense of comfort to the patient, who is enabled in many instances to be out of bed while undergoing treatment.

8. Economy in time, effort, and material.

9. Presumed adaptability of its use to dressing stations and ambulance trains. CARL R. STEINKE.

Phocas: Early and Total Discontinuance of Dressings in Surgical Wounds (De la suppression hâtive et de la suppression totale du pansement dans les plaies chirurgicales). *Bull. et mêm. Soc. de chir. de Par.*, 1918, xliv, 329.

Phocas reports the results obtained in 73 operations in which dressings were not used in the surgical wounds united by first intention.

The method was first tried out in small wounds of from 3 to 5 cmm. without drainage. The practice was then extended to larger wounds, appendiceal, hernial, etc., and finally to the extensive incisions of large abdominal laparotomies, limb wounds, and breast excisions treated in the civil hospitals.

The technique after operation was as follows: After careful catgut sutures of the deep layers the wound was flooded with ether and correct suture by layers was then done. The lips of the wound were united with close stitches, the knots being tied lateral to the wound. The neighborhood of the wound was washed with ether, but not the wound itself, in order to allow coagulation of the drops of blood made by the Reverdin needle. No compressive or irritating dressing whatever was put on the wound, but a piece of sterilized linen was fixed to the patient's shirt so as to preserve the wound from any contamination. By the following day the blood coagulum formed a blackish interrupted crust over the wound.

There may be a slight reddening along the wound. If there is slight infection a yellowish crust forms, but it is rare. There is usually no swelling. The course is simple. Some of the sutures are drawn by the fifth day and the rest by the eighth or ninth.

The 73 wounds thus treated include 13 appendicectomies, 17 herniæ with appendicectomies, 14 simple herniæ, 12 hysterectomies, and 1 breast excision. In this series there were 3 deaths but they were in no way due to the method because the wound was in all cases as firmly united as if it had been classically dressed.

Complete rupture of the wound is very rare. It was observed twice, but these cases were cured. Even in the most violent fits of coughing and vomiting the author has never observed rupture.

The author thinks that the protective rôle of dressings has been exaggerated. That the ordinary dressing protects a wound against infection is possible; but in the absence of a dressing the wound protects itself by the coagulum formed. This is a spontaneous dressing practically aseptic and affords sufficient security. The same cannot be said of the classical dressing which by depriving the wound of air and light creates a temperature suitable for development of pathogenic microbes, macerates the skin, and when it is badly done may itself be a cause of infection. Exposure to the air renders the wound painless more rapidly, and cicatrization is earlier.

According to the author's observations, the laparotomized fare best under this method. From the second day they feel comfortable, emissions of gas are easy, the abdomen is supple, and a slight ballooning does not produce the same distress as it does in a patient enclosed in a compressing bandage. Experience has also shown that the protective rôle of the dressing with regard to involuntary movements is of little importance.

The discontinuance of dressings according to the author is the result of a natural evolution in the treatment of wounds toward which there has been a trend since the antiseptic methods of Lister.

W. A. BRENNAN.

Morison, A. E.: Incarcerated Sepsis. *Lancet*, Lond., 1918, cxciv, 535.

All surgeons meet with cases where, as a result of slight trauma to a previously infected part, there has been lighted up an infection after the primary lesion had apparently soundly healed. Few war wounds pursue an aseptic course, and many, after having healed for a considerable time, break down and discharge pus. Moreover, some wounds have been soundly healed for months but as soon as an operation is performed the surgeon is disappointed to find that in a day or two the patient's temperature rises, he complains of pain in the operation area, and the wound is found inflamed and soon begins to discharge pus.

These cases occur where the probability of reinfection of the wound from without may be excluded and the only explanation that can be offered is that during the healing process organisms have become incarcerated in the deeper scar tissue of the wound and have been set free by operation.

In the course of operations it may be evident that small foci of incarcerated pus or granulation tissue containing active organisms threaten the result, and in spite of attempts to sterilize the areas with a powerful antiseptic, infection of the wound may follow.

A further result of the continual irritation caused by the presence of incarcerated organisms may be that a hard, dense scar is produced which causes pressure on underlying structures or it interferes with the free movement of joints or muscles. In the case of bone injuries, a dense osteosclerosis is set up around such an infective focus, and when any strain is put on the part, an aching pain, tenderness of bone, and constitutional disturbances may be produced.

For the past two years the author has made it a part of the routine preparation of cases previously wounded but now healed, before operation to order that the seat of injury be treated for a week or ten days with radiant-heat baths, from 150° to 250° F. for ten minutes daily. If incarcerated sepsis is present, the scar in two or three days becomes inflamed, fluctuation occurs, and as a rule, a small quantity of pus is evacuated. The wound is then encouraged to heal, and after healing, in a period of time varying from two weeks to three months, a further course of radiant heat is ordered. If no reaction occurs within a week, the operation may be safely proceeded with so far as any danger of buried sepsis is concerned. In no case of the author's in which this preliminary treatment has been carried out has there been failure with a rigid aseptic technique. The scars become more healthy, thinner, more mobile and elastic. V. C. HUNT.

ANÆSTHETICS

Gwathmey, J. T., and Karsner, H. T.: General Analgesia by Oral Administration. *Brit. M. J.*, 1918, i, 254.

This report is in the nature of a preliminary communication based on animal experiments and a sufficient number of clinical cases to support the conclusions of the animal work. It will be seen that general analgesia in which there is loss of sensation, with or without loss of consciousness, can be established for otherwise painful dressings or for short operations.

It is possible to administer the analgesic by mouth with perfect safety and it is applicable to all forms of painful dressings and is being developed to embrace such as resection of a rib, removal of a foreign body, etc.

Rabbits were selected for the preliminary work. The various substances were given by the stomach tube, the animals immediately released and observed. Quinine and urea hydrochloride, trional, morphine tartrate, paraldehyde, ether in olive oil, and other combinations were tried to determine whether analgesia could be produced by oral administration of proper agents. Various combinations of drugs were not very successful, and in rabbits the best results were obtained by the use of ether in oil. After these experiments it was considered safe to proceed with the investigation in man.

To administer the analgesia to man, it was given with port wine, which was found to be the best mixture. One ounce of port wine is placed in a glass and the analgesia in another glass. The patient takes a mouthful of wine and holds it for thirty seconds before swallowing. The ether mixture is then taken and followed immediately by the remainder of the wine. Numerous patients have taken it with excellent results. Only one patient has been nauseated. All of the cases have been able to take food and water shortly afterward, and even in patients much exhausted by infection there have been no deleterious effects. The ether mixture usually given was according to the following formula: ether and liquid paraffin, four fluid drachms of each, peppermint water, five minims.

The authors state that 50 per cent ether in liquid paraffin or other bland oil is probably the softest general analgesia, having apparently no deleterious effect upon the stomach, and is not followed by nausea and vomiting. V. C. HUNT.

SURGICAL INSTRUMENTS AND APPARATUS

Pearson, W.: Splints for Use in Arm, Ankle, and Leg Injuries, with Some Observations on Treatment. *Lancet*, Lond., 1918, cxciv, 670.

The right angle arm splint is of the Thomas pattern bent laterally to a right angle at the elbow. Extension or fixation is applied to the arm below the wound by means of lateral strips of adhesive plaster, or preferably by means of folded strips of gauze fixed with glue. It is applicable to both right and left arms, but must be stocked in two or three sizes as regards the length of the upper arm segment.

The ankle and leg splint is of light metal framework two feet long of one-quarter inch round iron bent up at the foot end long enough to suspend the foot, and at the upper end bent up enough to arch over the thigh. The leg is suspended between the two side bars hammock-fashion. Better results are obtained with much less difficulty and with greatly increased comfort of the patients.

CARL R. STEINKE.

Crile, D. W.: An Abduction Splint for the Femur. *Brit. M. J.*, 1918, i, 476.

The war has demonstrated that for the early treatment and transportation of patients with fractures of the femur, Thomas' knee splint is the best general utility splint.

However, fractures in the upper third of the femur when accompanied by extensive flesh wounds of the buttocks and hips present great difficulty to treatment with the Thomas splint, for these cases require abduction as well as extension, and their wounds should be available for dressing.

Because there was no splint meeting those requirements, the author has devised one which has proved satisfactory in his hands, and which is based upon the lines of the Thomas. The Thomas ring is transposed to the uninjured thigh, producing a base for extension against the ischial tuberosity on the sound side of the pelvis. Coming from this ring is the inner rod of the splint which is continued, as in the Thomas, into the outer rod which fastens to an iliac pad. This pad fits just below and parallel to the crest of the ileum on the same side as the fractured limb. The pad is continued into a broad band which passes around behind the pelvis and fits snugly to the hollow of the sacrum. In front the iliac pad and the ring are connected by an iron rod running transversely across the body. This is adjustable for width to fit any body. The band which passes around the back buckles to this transverse bar in front.

This splint is applicable to any case in which abduction is required, produces a maximum true abduction angle of 45 degrees, and can be adjusted to any lesser angle. The absence of the ring on the wounded thigh leaves space for dressings. The splint permits the patient considerable movement in bed.

Fixed extension can be changed to weight and pulley extension when desired. Flexion at the hip can be obtained by bending the splint or by elevating the foot as with a Thomas. The author has seen no tendency to scoliosis to persist after the splint is removed.

V. C. HUNT.

SURGERY OF THE HEAD AND NECK

HEAD

Speed, K.: Gunshots of the Head, with Especial Reference to Indications for Operation and Technique; Demonstration of Cases. *Surg. Clin. Chicago*, 1918, ii, 79.

Speed presents a very interesting treatise on the methods of handling gunshots of the head that occur in the present war.

He classifies gunshot wounds of the head into (a) non-penetrating, of the dura and brain, skull damage acknowledged; (b) penetrating brain wounds. As the basis for operation must be a pathologic one, he has made a working pathologic analysis of war wounds of the head as follows:

1. Mechanical pathology of gunshots.
2. Bacteriologic pathology, usually secondary.

The mechanical pathology concerns largely the patients who are received a short time after injury, and is of greater interest because bacterial action has not yet entered as a factor. The factors which are present and must be considered are shock or concussion, hæmorrhage, mechanical injury of vital portions of the brain and tissues about or remote from the missile tract, and finally the presence or absence of foreign bodies. Speed does not agree with Cushing's statement that after excising scalp wounds and removing depressed or damaged bone, one should proceed to open the dura when subdural hæmorrhage or cortical contusion is suspected, even though that membrane be intact. He does not believe that this should be done in operative work in the face of gunshot wounds and latent infection. He says that at the time of the Somme push last year many cases of head injuries came into his wards on which there was not time to operate, and after balancing up statistics some weeks later, he found that the mortality among unoperated patients, even in those in which scalp incisions were not practised and foreign bodies lay in the brain, was decidedly lower. He cites the investigations of Lieutenant-Colonel Warren, who followed over 1,200 patients from France to England and most closely recorded the results in at least 600 of them, concluding that many head operations in France were worse than useless and that many patients did better without operation because in that way they avoided hernia cerebri.

Speed believes that in wounds of the skull in which the dura does not seriously lose continuity and the brain is not penetrated, the subdural clots will be absorbed just as blood extravasations are elsewhere in the body and that there is no reason for opening the dura and washing out these clots.

He cites a case illustrating the reversion of the bullet that takes place in penetrating wounds of the head. In this case the bullet entered in the parietal region and passed down and forward, coming to lie just behind the right orbit. The roentgenogram shows that the bullet is completely reversed and the nose of bullet points exactly backward toward the wound of entrance. In every penetration where the bullet remains in the skull it tumbles just once and no more. If the velocity is high enough one may expect a through-and-through wound, but in bullets which are partly spent and are destined to stop within the skull, the tumbling occurs. This is explained by the fact that resistance of the lighter nose of the bullet tends to retard it and turn it down. The momentum of the heavier and bulkier body behind crowds it forward until it swings in a circle, and the heavier end finally comes around to lie in front as the missile travels on. For surgical pathology this has a significance, because the track made by the bullet is not a simple penetration tunnel, but results in a broadened full-length-of-the-bullet-wide track. The great shock of tumbling and transmitted rotatory force lends to the gravity of these wounds, and one must conclude that clinically these patients are in grave condition and should not be subjected to additional shock, as from operation, until partially recovered.

In penetrating shrapnel wounds the bone shower into the brain is relatively greater, but the total brain damage is not so great on account of the lack of rotatory motion.

He reports two cases representing mechanical pathology. The first one had a through-and-through wound from one temporal region to the other, rather high up. The skull was torn widely open; both hemispheres of the brain were deeply guttered; the longitudinal sinus was obliterated. The wound was cleaned, irrigated, bone fragments removed, and the trimmed scalp sutured over a drain of paraffin gauze. The patient apparently recovered from the effects of the operation, but died later.

In the second case the missile entered behind the orbit, traversed the front of the skull, and made exit behind the other orbit, fracturing the ethmoid, nasal, and frontal bones, and opening the base of the frontal fossa into which a finger could be passed. The brain was not lacerated, but every trace of ocular tissue had to be removed, so the patient is permanently blind. This patient made a good recovery and was sent to the base with every promise of remaining permanently well.

He says that many small or deep-lying foreign bodies do not demand removal. Cushing believes that bone fragments cause more irritation intracranially than metal, because the latter are of themselves slightly antiseptic. Speed believes on theoretic grounds and from clinical observation that the well-vascularized brain might be supposed to absorb in recovery small bone fragments deprived of their normal blood-supply, just as bone transplanted and finding no physiologic functional demand is absorbed elsewhere in the human body. Probably metal and bone are fairly negligible as bacteria carriers; rather must be considered the dirty scalp, hair, cloth, and other substances carried in, usually on the metal. Hence the practice to "get the metal." All these bodies require irrigation and removal if possible. Metal from shells is sterilized by the heat of fire; human skull bone is reasonably sterile, but the contamination comes from the external human tissues and clothing.

G. W. HOCHREIN.

Janeway, H. H.: Treatment of Cancer of the Lip by Radium; a Report of 24 Cases. *J. Am. M. Ass.*, 1918, lxx, 1051.

The exposed position of epithelioma of the lip renders it particularly favorable for successful treatment. Advice is sought earlier, as a rule, than in cancerous conditions elsewhere.

The lip is a favorable site for the treatment of epithelioma by radium. The rapidity of growth and size of the lesion are more important as determining the prognosis and malignancy than is the duration of the disease before treatment. Suddenly increased activity probably marks the transition between the localized cancerous stage and true infiltrating cancer.

Radium therapy saves the patient unnecessary sacrifice of large amounts of healthy tissue, and does not incur the danger arising from excising tissue too near the margin of the disease.

Considering the lymphatic extension as embolic in its nature, the author believes that the cervical lymph-nodes perform for a time a conservative function, and that early dissection, which involves some normal lymphatic tissue, may do harm.

When lymphatic vessels are incised, the prophylactic measure of placing radium in the wound against the vessel stumps is recommended.

From a review of his reported series of cases, the author recommends the use of radium in operable cancer of the lip; and that lymph-nodes be watched for metastatic development, and that such nodes be removed, and the wound treated with radium, at the time of operation.

The use of radium emanation instead of radium element is approved because of greater ease in obtaining uniform distribution. V. E. DUDMAN.

Gatewood, L.: Radical Surgery of the Maxillary Antrum with Conductive or Perineural Anæsthesia. *Internat. J. Surg.*, 1918, xxxi, 94.

A careful study of the anatomy of this region with especial attention to the relations of the infra-orbital and posterior superior dental nerves shows the feasibility of anæsthetizing these nerves by the injection of a local anæsthetic into the vicinity of their trunks.

The technique for blocking these trunks is simple, once a clear understanding of the anatomy is attained; and the advantages of this method are: (a) Less anæsthetic is required by the conductive method; (b) anæsthesia is produced with less pain; (c) the duration of the anæsthesia is greater; (d) less trauma is produced and the danger of infection is not so great.

Novocaine is the anæsthetic of choice in this connection, 2 ccm. of a two per cent solution being used. P. G. SKILLERN, JR.

Judd, E. S., New, G. B., and Mann, F. C.: The Effect of Trauma upon the Laryngeal Nerves. *Ann. Surg.*, Phila., 1918, lxvii, 257.

To determine the cause of such paralyses as are sometimes seen following thyroidectomy, the authors undertook a series of traumatic procedures on the recurrent laryngeals in dogs. All operations were done under ether anæsthesia and sterile technique. The function of the vocal cords was observed by direct laryngoscopy without an anæsthetic and the results noted without the observer knowing what operation had been performed or what his results were in previous observations.

From these experiments it seems that section of the recurrent laryngeal nerve produces complete paralysis of the vocal cord of the corresponding side which in all probability is permanent. Ligation of the recurrent laryngeal nerve with linen or catgut produces complete and probably permanent paralysis of the vocal cord on the corresponding side.

Stretching the nerve in a manner similar to but of longer duration and greater intensity than that occurring in operation does not impair the function of the vocal cord. Stretching for a long period, as over muscles, impairs the function of the vocal cords, but this impairment is probably due to trauma rather than to the stretching. Pinching the nerves with a hæmostat in a manner similar to that which may occur in an operation produces temporary paralysis, but restoration of function always occurs, the length of time depending upon the anatomical point at which the nerve was crushed.

The time found necessary for complete regeneration of the nerve when injured in the areas usually traumatized by operation varies from thirty to sixty days. Exploration of the nerves produces an effect on the vocal cords depending on the amount of trauma to which the nerves are subjected. Careful dissection will probably have no effect provided there has been no trauma. GATEWOOD.

Sharpe, W.: Fractures of the Skull; the Resulting Intracranial Pathology and the Treatment. *Med. & Surg.*, 1918, ii, 319.

The pathology of traumatic cerebral œdema may be similar to a localized traumatic œdema such as occurs elsewhere in the body. In head injuries, as in concussion, there is increase of intracranial pressure which may be recognized by the ophthalmoscopic examination of the fundi, and by measurement of the pressure of the cerebrospinal fluid at lumbar puncture by means of the spinal mercurial manometer, which test reveals in such cases a marked increase in the amount of fluid in the central nervous system. This increased amount of the fluid is subarachnoidal and its source undetermined, but the author's impression is that cerebral œdema results from an increase in the amount of cerebrospinal fluid secreted by the choroid plexus chiefly, and also from the partial blockage of the excretion of cerebrospinal fluid due to congestion and a temporary retardation of the flow of blood in the cortical veins and the sinuses.

As to the diagnosis of brain injuries, the clinical signs and symptoms are confusing as in many cases the more extensive the fracture, the less seriously is the brain injured, and the most dangerous of brain injuries may not even be associated with fracture of the skull. The most important factor to be determined is the presence or absence of an increased intracranial pressure. In treating 239 adult patients having acute brain injuries, only 79 or 34 per cent showed increased intracranial pressure and were operated upon. The remaining 160 were treated by the expectant palliative methods of absolute quiet, ice helmet, and catharsis. A definite diagnosis should be made early and patients should not be allowed to develop definite paralysis, a low pulse-rate, Cheyne-Stokes respiration, etc., symptoms of resulting medullary compression.

In head injuries the symptoms of shock are usually the first to appear and the usual treatment for shock should be instituted. Intracranial pressure symptoms appear about six hours after the head injury. As the patient recovers from the condition of extreme shock, the blood-pressure will rise and the signs of intracranial pressure become manifest. Repeated ophthalmoscopic examinations of the fundi should be made to determine the earliest signs of pressure. In the early stages of pressure there will be a dilatation of the retinal veins and an œdematous blurring of the nasal halves of the fundi. Later when the pressure becomes still higher the temporal halves of the optic discs will become obscured. The ophthalmoscopic examination should be supplemented by a measurement of the pressure of the cerebrospinal fluid at lumbar puncture with the spinal mercurial manometer. The normal pressure is 5 to 9 mm. of mercury, so that if a pressure higher than 15 mm. is obtained, it may be concluded that the ophthalmoscopic findings are confirmed.

If the traumatic intracranial pressure is mild, the convalescence can frequently be shortened, the headaches be relieved, and the general condition of the patient greatly improved by one or more lumbar punctures. This practice should never be instituted in a patient with high intracranial pressure or in subtentorial lesions for fear of consequent medullary compression in the foramen magnum.

The two periods in which an operation is distinctly contra-indicated in cases of brain injury are: first, the condition of shock in the very beginning; and second, the condition of medullary collapse. Cases of depressed fracture of the vault should, of course, always be elevated or removed. If these two extremes can be avoided, the rational operative treatment should depend upon the presence or absence of an increase in the intracranial pressure whether there is a fracture of the skull or not. Even the X-ray, though important, should never be allowed to delay the operative procedure. Many cases of head injuries at autopsy have revealed no hæmorrhage at all, merely a "wet," œdematous, swollen brain but sufficient to cause medullary compression and the death of the patient.

The operation of choice, where operative procedure is indicated, is the subtemporal decompression and drainage. In the absence of localizing signs, the decompression should always be performed on the right side in right-handed patients, as the motor speech area of such is in the left cerebral cortex. This route exposes first the silent area (temporosphenoidal lobe); second, the middle meningeal artery and that portion of the skull so frequently exposed to fracture; third, the middle fossa of the skull, the chief intracranial cistern, at its lowest point; fourth, the squamous portion of the temporal bone, the thinness of which makes the operation less difficult.

If the intracranial pressure is so high that the cerebral cortex tends to protrude through the bony opening made, it is frequently wiser in selected cases to perform a similar operation upon the opposite

side of the head. It may in some cases, however, be best to wait one or two days for the second operation. In 5 per cent of the total patients operated upon, this was done. Rubber tissue drains are removed the first or second day. The patient should not be allowed to return to active life for several months following the operation, and repeated ophthalmoscopic examinations should be made of the fundi of the eyes to rule out a persistence or recurrence of the intracranial pressure.

P. W. SWEET.

Walthal, D. O.: Recovery of a Case of Purulent Meningitis Complicating Mastoiditis. *J. Mich. St. M. Soc.*, 1918, xvii, 102.

The case reported is of a child seven years old who developed a mastoiditis which spread through the petrous portion of the temporal bone and involved a small area of the dura, causing a purulent meningitis as shown by spinal puncture. The infected tissue was removed and the wound closed partially; the patient left the hospital.

Fourteen days later she developed fever and other signs of meningitis and returned to the hospital, when the wound opened and discharged very foul pus. The wound was irrigated with saline. It is closing, and the patient is afebrile and playing about the ward. The value of lumbar puncture as a means of early diagnosis and the necessity of early operation is emphasized. H. J. VAN DEN BERG.

Gray, H. M. W.: Treatment of War Wounds of the Brain and Its Coverings at Casualty Clearing Stations. *N. Y. M. J.*, 1918, cvii, 407, 457.

The objects of treatment can be shortly summed up as follows: (1) to prevent or remove infection, thereby preventing further destruction of tissue; (2) to establish diagnosis in some cases of doubt; (3) to remove all sources of irritation to the brain, if this can be done without causing further serious damage to it; (4) in any case to procure rapid healing of the superficial parts, provided that the brain is safe.

The author regrets that he has refrained from operation or has not operated sooner upon some patients who have done badly. In all injuries it is held that operation furnishes an additional and usually accurate means of diagnosing the extent of the lesion. In minor injuries it has done no harm, so far as can be ascertained, and it renders the patient fit to return to duty at a much earlier date than would otherwise be the case.

It is better to send a patient home with a healed scalp and healthy skull, inside which are the fewest possible potentialities for future brain trouble than that he should go with the prospect of a later operation on an area which is obscured by many abnormalities. If it can be shown that this is done with as great safety as attends more conservative methods, the procedure is more than justified. Sepsis and the exigencies of war will always make the proportion of failures a relatively high one.

On admission, the patient's hair should be shaved off or removed with a depilatory paste, the wound thoroughly examined (the use of a probe is deprecated), two roentgenograms taken in planes at right angles to each other, and a neurological examination made. An aperient should be given and the administration of urotropine, fifteen to twenty grains every three or four hours, begun. If the brain is injured, it is well if possible for future guidance to make a bacteriological examination of the discharge. If brain matter is exposed or exuding from the wound, operation should be carried out as soon as possible. In no case should operation be postponed for a longer period than a couple of days.

The majority of wounds of the scalp should be excised, and the bone beneath carefully examined. If no further interference is made, the wounds can be sutured, usually without drainage. The wound itself should be cauterized, or desiccated by thorough rubbing with five to ten per cent picric acid in spirits and drying with a swab. In practically all cases the area of operation can be covered in by healthy scalp by simple suture or by a plastic operation. Every case in which depressed fracture of the skull is suspected should be explored without undue delay, whether sepsis is present or not. If the edge of the wound is much inflamed and infiltrated, treatment with hypertonic saline applications or a paraffin paste usually makes it fit for excision in twenty-four to forty-eight hours.

The injury comes under one of the following varieties:

1. Cases without definite external signs of depressed fracture. Because fracture with displacement of the inner table or some other subcranial lesion may be present, it is important that operation should be carried out. If focal loss of function, even although evanescent, persistent headache, giddiness, or other more definite signs of cerebral compression are present, especially if optic neuritis co-exists, trephining should be done, even in the absence of definite laceration of the periosteum. If fracture of the outer table without depression is found, or even if the bone is merely bruised, a small trephine opening in the external table only should be made and the inner table examined.

2. Fracture with depression but without injury to the dura mater. The fractured and probably septic bone is excised either by making a very small trephine opening outside the soiled area and completing the removal with a skull-cutting forceps, e. g., DeVilbis, just wide of the shattered bone, or by the nibbling method, using a properly devised small gouge forceps. If the dura is apparently normal and the brain pulsates well, the operation can then be completed by suture of the scalp with or without drainage. If, however, the dura is muddy-looking, if there is loss of pulsation and circumscribed loss of elasticity, especially if focal symptoms have been present after the wound was received, the dura should be opened.

3. Injury of the dura without foreign body or sepsis. Fracture with injury to the dura mater, when no foreign body is present and the wound in the brain probably aseptic occurs frequently. After excision, *en masse* as before, the scalp wound may be enlarged in any desired direction in order to procure adequate access. The bone around the fracture is cleared. The spicules are removed and the skull cut away carefully with forceps to an extent varying with the injury to the dura. A clear margin of one-third of an inch of uninjured dura should be exposed. Great care must be exercised to separate the dura from the bone while this is being done. Ragged edges of dura should be excised. If a track exists in the brain, this should be carefully explored, by the finger if possible, and any collection of pulped brain tissue allowed to escape. A drain of folded jaconet or small rubber tubing should reach from the opening in the dura through one end of the wound. It should be removed after twenty-four hours. If sepsis asserts itself, the wound should be freely opened up at once.

4. Injury to the dura complicated by a foreign body in the brain and by sepsis. The position of the foreign body is previously determined by X-rays. At the operation, as in type 3, the track through the brain matter can usually be explored by the index finger. The foreign body having been located, a suitable flat or slightly curved scoop is passed along the finger under the foreign body which is then pressed against the point of the finger, and all three are carefully and gently withdrawn. A foreign body or piece of bone may often be coaxed out by making very slight flexion movements with the distal phalanx of the examining finger. If the track will not admit the finger, the foreign body can usually be left with safety. A drain should be inserted in all cases, as already described. If definite sepsis is present, drains should be inserted in the track, leading straight out through the wound. In the worst cases the scalp wound should not be sutured until all danger has passed.

The author believes the exploration for foreign bodies by the finger at the primary operation is justified by the following considerations: (1) A track through brain substance is already present; (2) only very rarely is further injury to the brain caused by the procedure; (3) an abscess frequently develops if the foreign body is left in the brain; (4) if the wounds are large, sepsis has almost certainly penetrated along with, or following, the foreign bodies, and as has been said, the sooner they are dealt with, the better.

Operation in cases of fracture with injury to one of the blood sinuses may be difficult on account of the alarming hæmorrhage which may occur during the exposure of the sinus. The results of such operations have been very favorable. It has been found that practically all cases which survive the immediate effects of the injury are amenable to treatment by the application under light pressure of a piece of aponeurosis cut from the edge of the scalp wound or from the fascia lata of the thigh. The procedure is known as the "postage stamp" operation.

The graft should always be covered by scalp at the end of the operation. In these cases it is practically always possible to suture the scalp wound completely, a small soft drain being inserted close to but not on the graft, and withdrawn in a day or two.

Lumbar puncture has frequently been found to give relief in cases of local circulatory disturbance after operation, evidenced, for example, by persistent headache, recurring focal muscular spasms, or slight hernia cerebri. The amount of cerebrospinal fluid withdrawn varies with the pressure of the fluid. It is rarely necessary to remove more than 25 ccm. The process may be repeated several times if thought advisable. It ought to be resorted to before any marked signs occur.

The wound should always be exposed for inspection when lumbar puncture is done, because this may cause the herniated brain to sink back to a considerable depth and protective adhesions may be torn. If lumbar puncture fails to alleviate the condition, a contralateral decompression operation may be tried. The free application of "bipp" has been found of great value in many cases. In most cases of hernia cerebri it will be found that posture has a marked effect, the protrusion being lessened when the patient is propped up in the Fowler position. This position should be adopted immediately after operation. A smart intestinal purgative is also sometimes effective. It is not advisable to make lumbar puncture in the early stages after a wound of the brain has been caused, unless the dura is intact, or until the exact local conditions have been revealed by operation.

In the great majority of cases the elliptical wounds resulting from excision can be closed, owing to the mobility of the scalp, if all layer sutures are used with superficial sutures between. It is well to work from each end in tying the sutures. In cases where complete closure cannot be obtained by this method, one must not hesitate to use plastic means, to which the scalp is particularly adaptable. A successful and widely used method is by extension of the original incision to form a large U- or S-flap. The ends of the wounds may be sutured to reduce the amount of plastic necessary. The scalp is undermined to any desired extent. When fully sutured there should be little tension; if there is much, the scalp should be scarified repeatedly between the sutures, sufficiently to draw blood. The line of sutures lies frequently completely to one side of the wound in the dura. Thus this method has an advantage over that of turning down a flap, and is no more elaborate.

The operation necessary in the majority of head injuries is a comparatively simple one. If preceded by infiltration of the scalp with local anæsthetic and adrenalin, hæmorrhage and shock are obviated to a very great extent and the operation made even

more simple. The dangerous hæmorrhage which may occur from large flap incisions is entirely prevented by this infiltration of the incision area with adrenalin solution, and, if some local anæsthetic has been added, the amount of general anæsthetic required is negligible. All serious cases should be kept at the casualty clearing station for two or three weeks after operation, and even longer if one is not quite satisfied with their condition.

E. C. ROBITSHEK.

Cushing, H.: Study of a Series of Wounds Involving the Brain and Its Enveloping Structures. *Brit. J. Surg.*, 1918, v, 558.

In this article Cushing gives in detail the results of the study of end-results in a consecutive series of 250 head injuries observed during the past three years. He states that there is less unanimity of opinion as to the treatment of craniocerebral injuries than of any other type of wounds. In a previous report on 219 cases in the *British Medical Journal* of February 23, 1918, he has already called attention to a method of treating penetrating wounds which had lowered the mortality from 54.5 to 28.8 per cent. The essential features of this method were the removal *en bloc* of the area of bony involvement, the withdrawal by suction through a soft catheter of the devitalized cerebral tissue lining the track without enlargement of the dural opening, and the extraction of bone fragments with the least possible increase in the trauma already produced.

Their early cases, under a general anæsthetic with flap exposures and imperfect cleansing of the track, did very badly and the mortality, usually due to infection, ranged between 50 and 60 per cent. To the victim of the injury, the injury to the brain is of far more importance than that of the skull. In this paper Cushing grades the cases according to their severity.

The chief elements to be considered in all of these grades are (a) the question of dural penetration; (b) the cerebral extrusion (hernia cerebri); (c) the penetration of the ventricles; and (d) the opening of portals of infection through the nose and inner ear. A detailed consideration follows:

Group 1. Wounds of the scalp. There is a tendency to underestimate these and to forget that one can readily overlook a fracture of the skull even if there is sufficient time to have an X-ray taken, because a slightly depressed fracture often fails to show in a lateral view. Again one must remember that an intact external table may conceal an injury of the internal table with serious cerebral contusions due to penetration of fragments. An instructive case of this kind is described and most excellently illustrated. Some of the very serious scalp wounds were produced by the missile penetrating the helmet, as a result of which portions of the metal entered the scalp and skull.

Group 2. Local fractures with intact dura with or without cerebral contusion. There are two types: (a) in which the external table is practically intact with or without a verified depression of the inner table. In this sub-group, trephining must rest on one's judgment in the individual case, while in the second or subgroup (b), where there is a depression of both tables, trephining is invariably indicated even in the absence of neurological symptoms.

The widespread impression that one should never open the intact dura is born of early experiences in the war when the technique was less perfect. Unless the external wound is very septic, no risk is run provided it is closed immediately with delicate silk sutures. Even the pericranium may be uninjured and conceal a fracture. Whenever the neurological symptoms indicate a contusion, an exploration even in the presence of an intact dura, if it can be done with reasonable safety, will hasten the convalescence and restoration of function as the result of the removal of the devitalized cerebral tissue.

Group 3. Wounds with local depressed fractures, laceration of the dura and cerebral contusion. The prognosis is good because extrusion of the brain is prevented in these cases by the depressed fragments, hence there is no immediate risk of intracranial infection. Usually both tables are depressed but the bone may be only fissured or scored or even intact. Occipital cases do not do as well after operation as frontal ones because the latter are more accessible. Block trephining is to be preferred to the more common method of removal piece by piece because freer access is given to the point of laceration and a sharp hæmorrhage due to a fragment penetrating one of the venous sinuses is easily controlled.

Operations under local anæsthesia are less apt to be followed by bleeding because the vomiting so common after inhalation of anæsthesia raises the venous tension.

Group 4. Wounds, usually of gutter type, with detached bone fragments driven into the brain.

The risk of infection is much greater because there is a considerable defect in the skull through which brain substance protrudes and also because fragments of bone, usually contaminated, are driven into the brain. The injury to the skull itself is usually of the "gutter" type, produced by tangential wounds over the thicker portions, especially the parietal and frontal regions.

It is necessary to distinguish between cases in which the fragments have been driven into the lateral ventricles and those in which this has not taken place. The former condition was found in 14 of the 39 cases in this group, and the gravity of the prognosis in such cases is shown by the fact that 6 of the 14, or 42.8 per cent died.

Owing to the location of the majority of these wounds in the parietal vertex, many show the longitudinal sinus syndrome to which Sargent and Holmes first called attention, the most prominent symptoms of which are a bilateral spastic

Group 2. (Cushing).

paralysis of the lower extremities with possible involvement of one or both arms. Cushing describes in detail three cases in which this syndrome was found accompanying a gutter wound of the vertex and all showing the typical findings of a contusion of the mesial edges of both hemispheres.

The autopsies on four of the six cases where the fragments had penetrated the ventricle all revealed the fact that there had been an incomplete treatment of the track which was later extruded with a developing hernia cerebri. The fatalities in other words were due to abscess formation, meningitis, and gas encephalitis. The existence of the last named condition can no longer be questioned and emphasizes the necessity of removing all the devitalized tissue together with projectile and bone fragments.

Group 5. Penetrating wounds with lodgement both of projectile and bone fragments. There is a greater danger of a primary deep-seated infection when a projectile is lodged in the brain than from indriven bone fragments. This group is the largest of the nine into which Cushing divides his cases. Disregarding all other elements affecting the prognosis, the cases in this group, like those in Group 4 may be divided into two classes: (a) those in which the ventricle has escaped injury (41 cases, 26 recoveries, mortality 36.6 per cent); and (b) those in which the projectile has lodged in or traversed the ventricle (16 cases, no recoveries).

There was a predominance of wounds of entrance in the temporal region, the majority of the direct penetrating variety with relatively small scalp wounds. The missile was a shell or bomb fragment in 48 of the 57 cases of this group. In 22 of the 57, the missile was removed with the magnet and nail, but in 35 it was not removed either on account of its small size or inaccessibility. The mortality in the 35 cases in which the missile was retained (13 ventricular) was 60 per cent, and in the 22 in which it was removed (4 ventricular) the mortality was 31.8 per cent. A shrapnel ball is far less likely to carry in and implant infective material than is a jagged shell fragment. The cases with parietal penetration showed by far the highest mortality, there being 8 deaths with only 2 recoveries.

One may be deceived by the apparently good recovery made from the original injury in cases where the wound has been insufficiently treated. Such cases are often evacuated too early and succumb later either to a cerebral abscess or to a basilar meningitis due to rupture of an abscess into the ventricles.

Two most instructive cases of this kind are described showing the necessity of thorough primary wound treatment.

Group 6. Ventricles penetrated or traversed by bone fragments or projectiles. Emphasis has been laid by all on the fact that the prognosis in head injuries, so far as infection is concerned, chiefly rests on whether or not the dura is intact. It has been shown, however, that minor punctures of the dura (Group 3) are not necessarily accompanied by a bad prognosis, for, contrary to the general view, a fatal meningitis which spreads from the area of penetration is comparatively rare. Still more serious are the lesions (Groups 4 and 5) in which fragments, often soiled, are driven into the cerebral substance, and if not completely removed, leave an infected track, with swelling and extrusion of the œdematous brain through the dural opening and external wound,—the all too familiar fungus cerebri. In the course of time, either the suppurative process finds its way into the ventricle, or the advancing fungus distorts the hemisphere and draws out the ventricle, which ruptures into the infected track.

The prognosis is most grave, however, if the ventricle has been primarily opened with resultant early infection of the cerebrospinal fluid. There are two types of cases in this group: (a) those in which the ventricle has been penetrated by bone fragments; and (b) those in which it has been traversed or penetrated by a projectile. It is of interest to note that of 14 cases in the first type there were 6 deaths (42.8 per cent) while in the second type there were 16 cases with a mortality of 100 per cent. The projectile often lodges in the ventricle, this being true of 6 of the 16 cases.

Cushing is of the opinion that a serious infection may be established if the wounded are kept too long in the resuscitation ward. A cranial operation under combined morphine and a local anæsthetic may be carried out at the same time that warmth, fluids, and stimulants are administered. Cases with small foreign bodies do well if they pass the stage of early septic complication, but the latter occurs so frequently that one may with all conservatism follow the rule, "always remove a foreign body when possible," unless the act of removal is likely to increase the danger already made by the penetration. In many cases the patient lies

Group 3. (Cushing).

Group 4. (Cushing).

out unattended for a long time so that infection is given an opportunity to be established.

Group 7. Wounds of craniocerebral type involving the face and ear. Cushing doubts whether these should be placed in a separate group. They represent injuries usually of a severe nature in which, in addition to a wound exposing the brain, either the ethmoid cells and nasal sinuses have been opened (craniocerebronasal type), or the ear and petrous portion of the temporal bone has been involved (craniocerebro-aural type). In both types there is an added risk of secondary meningeal infection over and above that entailed by the original implantation of infected material in the wound. These cases are of an immediately serious nature, are associated with wounds passing from the cranium to the face, and in some there is a marked elevation of large bone fragments. The mortality in the 16 cases of this group was very high, 73.3 per cent. In one of the fatal cases a large unsuspected abscess formed in the relatively undamaged frontal lobe which, as is so typical of such cases, gave rise to no evidence of its presence except some headache followed by sudden onset of coma and high fever. At autopsy there was no meningitis present, but the left frontal lobe was occupied by a huge partly encapsulated abscess which communicated with the wound through a small punctured opening in the dura at the anterior tip of the lobe. The puncture had not been observed at the operation.

It is possible that Dakin's disclosure of the antiseptic value of dichloramine-T when sprayed on the nasal mucous membrane may make this an invaluable routine procedure in all basal fractures involving the cribiform plate. There was a higher percentage of fatalities in the cases in which the fracture permitted of communication between the middle ear and the brain. There were only 7 cases of this craniocerebro-aural type, with 6 deaths.

Group 8. Wounds traversing the cranial chamber. This new group contains only 5 cases with but 1 recovery. The reason for this is that few with wounds of this type survived to be brought into the hospital, hence under better conditions there should have been a much higher degree of recoverability from perforating wounds. Many of the cases which would be placed by others in such a group of through-and-through injuries have been placed by the author either in Group 5, where missiles stopped short of emergence, or in Group 6, where they traversed both the cranium and parts of the face or ear.

Group 9. Bursting fractures with widespread cerebral contusion. In this, the last group have been placed certain cases of major severity in which diffuse cranial fractures are associated with extensive and widespread contusions of the brain. They represent a type of injury which can be best relieved by a properly conducted cerebral decompression.

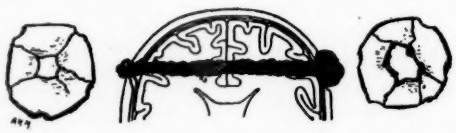
Among the 10 cases in the series which have gravitated to this group, there were 5 fatalities, a mortality of 50 per cent. This fairly high percentage of recoveries does not really represent the grade of case which the group was intended to contain, for a number of surgically treated fractures, largely basilar in type (three), have come to be included for lack of a more suitable group in which to put them. Other basilar fractures which recovered without operation or following a lumbar puncture are incorporated among the non-operative cases.

The question might naturally be asked, in cases of this kind, whether, after all, the decompression is essential, and whether lumbar puncture might not answer the same purpose, for one is not dealing with a permanent source of pressure like a tumor, but with a self-limiting process, provided the medulla is not complicated. It is well known that

Group 5. (Cushing).

Group 6. (Cushing).

Group 7. (Cushing).



Group 8. (Cushing).

Group 9. (Cushing).

in these conditions of cerebral contusion the brain shows a marked tendency to take up fluids and become œdematous, and oftentimes the cerebrospinal spaces contain an excess of blood-stained fluid, even the subdural space, which under normal conditions contains very little fluid. It has become a matter of common observation that some measure of relief can be afforded by the withdrawal of fluid by the lumbar meninges. However, when the brain itself is greatly contused and swollen, the mere withdrawal of 20 or 30 ccm. from the cerebrospinal spaces is but a temporizing measure. Hence these punctures, even if repeated daily, actually afford but a very brief period of relief.

The operation for a subtemporal decompression is not always easy, and requires experience, facility, and a special type of rongeur forceps, if, without undue injury to temporal muscle, an opening of sufficient size is to be secured. However, there is little doubt but that in many cases a much more prompt return of consciousness is afforded by this measure than would otherwise occur, and in some cases it may be a life-saving procedure.

The term "cerebral decompression" is often very loosely used, not to say abused. The mere making of a hole in the skull around a depressed fracture, with wide opening of the dura to relieve pressure of a local contusion or infection, led to many disasters earlier in the war; and it is much better to restrict not only the term, but the procedure, as in the case of tumors, to measures directed toward the relief of pressure carried out in clean fields under temporal or suboccipital muscles, with immediate secure closure of the overlying structures. At best, however, a subtemporal decompression is not a measure of very wide scope in the craniocerebral injuries of warfare.

There is a general tendency on the part of orderlies and nurses who may be unfamiliar with head cases, or uninstructed as regards this particular point, to attempt to feed semi-conscious patients. A typical bronchopneumonia, brought about by misdirected efforts to administer fluids to patients with inactive swallowing reflexes, is a far from uncommon sequel. It is a good rule to keep every stuporous patient in a semi-prone position, and trial feedings should never be first attempted while they are lying on their backs.

The operative procedure. The principles of primary wound treatment which are now generally employed by the allies, namely, excision and closure, cannot be applied to injuries of the skull and brain. The chief reason for failure in the past has been the long period of time which was allowed to elapse before thorough wound treatment was instituted, thus permitting infection to become well established.

As generally practised, the cleansing of a contaminated craniocerebral lesion has usually consisted in the excision of the scalp wound, piecemeal removal of the bony lesion, enlargement of the dural opening, extraction so far as possible, usually with the insertion of a finger, of the indriven fragments of bone or metal, and closure by sliding or replacing a flap of scalp over the area of the wound. This has been the practice, not only in the early hours when the wound is merely contaminated, but later on when infection has become established.

Subsequently, by the aid of alternate irrigation and suction through a soft flexible catheter inserted in the track, the clots and devitalized brain substance are painstakingly removed, the fragments of bone detected by the catheter are picked out by delicate forceps, and the projectile in as many cases as possible is extracted by the magnet. In short, the same principles of *debridement* utilized so successfully for wounds elsewhere have in their essentials been adapted to wounds involving the brain.

It would seem best that these operations should be performed at a forward area, preferably under local anæsthesia.

The clinical histories of the 219 operated cases have shown clearly that a large number of the recorded fatalities were avoidable, not only by the employment of a still more perfect technique, but by its more prompt application. The effects of cerebral contusion are often confused with shock, and the condition of many of these head cases does not improve until trepanation makes possible the evacuation from the intracranial chamber of the clots and pulped brain which are the occasion of pressure symptoms. In the present series, the more serious cases were retained for an average of twelve days.

The careful studies by Sargent and Holmes of a series of 1,239 cases, and by Tuffier and Guillain of a series of 6,664 cases which had recovered after trephining have shown that late sequels, such as epilepsy, insanity, delayed abscess, crippling paralyses, and other residual infirmities, are far

less common than had been anticipated. This may serve as an additional source of encouragement for those called upon to operate upon these difficult neurological cases. D. N. EISENDRATH.

Salmon, A.: Oculocerebellar Syndrome and Alternating Hemiparesis Due to a Tumor of the Posterior Quadrigeminal Eminence (Sindrome oculo-cerebellare ed emiparesi alterna da tumore probabilmente gommoso di una eminenza quadrigemina posteriore). *Riv. di patol. nerv. e ment.*, Firenze, 1917, xxii, 505.

Tumors of the quadrigeminal eminence are comparatively rare. In 1910 Valobra in his thesis collected 56 cases from the literature.

The author relates a case observed in an infantry officer who had contracted syphilis three years before and whose Wassermann test was strongly positive. This patient showed the following syndrome: cephalalgia, vomiting, paralysis of the left superior oblique muscle, nystagmus, cerebellar ataxia, right-sided hemiparesis suggesting a tumor of the quadrigeminal bodies, localized particularly at the posterior bigeminal eminence. It is just at this point that the fourth nerve is in close contiguity with the posterior cerebellar pedunculi; hence the association of paralysis of the fourth nerve with the ataxia of cerebellar type.

The patient was placed on an intensive mercuric treatment and the symptoms rapidly abated.

The author feels justified in classifying this case as a tumor of the posterior quadrigeminal eminence, as the symptoms corresponded perfectly to those known in such cases. The alternating syndrome, fourth nerve paralysis on one side, hemiplegia or hemiparesis of the opposite side, shows an unilateral mesencephalic lesion situated about a posterior bigeminal eminence since it is in this region that the fourth nerve originates and departs on its course. W. A. BRENNAN.

NECK

Dowd, C. N.: Indications for Removal of Enlarged Cervical Lymph-Nodes. *N. Y. St. J. Med.*, 1918, xviii, 109.

Dowd states that the main indication for surgery in the case of enlarged cervical lymph-glands is the presence of tuberculosis and therefore it is important to make the diagnosis of tuberculosis early. Hyperplastic inflammation seldom calls for surgery. Hodgkin's disease and lymphosarcoma occasionally call for surgical interference, but the massive enlargement usually gives manifest indication. If a prompt diagnosis is made in the tuberculous cases, nearly all of them are curable by operation. The main difficulty is to distinguish tuberculous enlargement from simple hyperplastic enlargement. While some clinicians believe that nearly all enlarged lymph-nodes are tuberculous, those who have excised and examined them find that only a moderate proportion show the presence of tuberculosis.

There are certain guides for diagnosis. Childhood is the period of greatest lymphatic activity. Neck tuberculosis is rarely found in children under two years of age. Children under this age frequently have pyogenic infections which lead to abscess formation, but as these abscesses are acute and large, they bear little resemblance to the slowly progressing local cold abscesses which come from tuberculosis.

Progressive tuberculosis of the cervical lymph-nodes manifests itself in two main forms: (1) In about 80 per cent of the cases caseation and abscess formation result. In this stage the diagnosis is usually very simple, for the primary enlargement is usually just below the angle of the jaw and the cold abscess is located there or in a locality which pus from that source can reach. (2) In the remaining 20 per cent, the lymph-nodes enlarge without abscess formation and may extend throughout the neck from the mastoid to the clavicle, and from the internal jugular vein backward under the trapezius and forward under the jaws. They are rather hard, matter together, are not easily movable, and do not show as good a tendency to local limitation as do the caseating variety.

Hyperplastic nodes show a tendency to subside. Dowd has records of 726 cases operated upon by himself or his assistants, and his results have shown that the earlier the case is operated upon, the more favorable the result.

He says that there are three very practical considerations which bear on the subject and which have prevented many physicians from knowing just what surgery can do. These are: (1) uncertainties in diagnosis; (2) technicalities in operation; (3) recurrences in late and unfavorable cases.

The uncertainties in diagnosis cause two types of errors. When tuberculosis is present and not recognized, the patient drifts past the most favorable period for successful treatment; and second, when simple hyperplastic glands are wrongly believed to be tuberculous, the patient is subjected to unnecessary operation and suffering.

The details of the operation involve many technicalities and unless the surgeon is well versed in the anatomy of this particular region, he is liable to cause serious damage to the surrounding tissues. Cases of facial paralysis and cutting of the spinal accessory have been reported as a result of carelessness or lack of necessary knowledge on the part of the operator.

Those men who only see late and unfavorable cases are not enthusiastic about operation. Surgeons whose experience is largely with adult patients with extensive tuberculosis naturally do not become enthusiastic over the treatment in children and in this way many cases which would otherwise be cured are permitted to reach a stage where operative treatment is of little permanent value.

Three kinds of treatment are often considered: constitutional, X-ray, and tuberculin. Dowd has made a study of all three and can see no reason for

advocating long periods of treatment which give uncertain results when there is a simple short treatment which gives such good results. He advocates the best hygienic and constitutional surroundings which can be obtained, but as many of his cases lived in unsanitary tenement house surroundings, he has had the opportunity of seeing what surgery can do without hygienic help. He says that the fear and suspicion of surgery brought about by a misapprehension of what surgery will do are the reasons for delaying operative treatment in many of these cases. G. W. HOCHREIN.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Boggs, R. H.: The Treatment of Carcinoma of the Breast by the Roentgen Rays. *Interst. M. J.*, 1918, xxv, 210.

The author states that roentgen therapy is today a recognized method in the treatment of postoperative cases, recurrent and metastatic, primary inoperable and primary cases which do not permit operation. He believes even in early cases operation should be supplemented by roentgen therapy, thereby preventing from 25 to 50 per cent of recurrences. To be effective this radiation should be done thoroughly by competent operators, giving full physiological doses to every chain of lymphatics draining the breast as well as to the opposite side of the body. Roentgen radiation produces a sclerosis of the lymphatics which in itself tends to oppose cancer dissemination. Such treatment is of value as an ante-operative as well as postoperative procedure, often rendering an advanced case operable, and if deep metastases have not taken place, more permanent cures can be obtained surgically.

The author uses the cross-fire method as much as possible. Three or four areas of anterior chest wall receive treatment and the liver area is given one anteriorly, laterally, and posteriorly. The axilla is given three or four doses and the lateral chest wall below the axilla an additional one. The supraclavicular region is divided into four areas. The supra- and subscapular areas on the affected side each receive a full dose. The mediastinum should receive one or two treatments through the back. The opposite side is rayed according to indications and never receives less than from four to ninety-eight treatments during the course. The epigastric region must never be omitted, as this is one of the avenues by which the liver and pelvic viscera metastasize.

Since operation has about reached its limit and since ultraradical operations are not practical until some better form of treatment is discovered, the splendid results achieved from radiation furnish more than sufficient reasons for giving every case of carcinoma of the breast postroentgen treatment. In recurrent and inoperable cases, often a temporary cure can be produced. ADOLPH HARTUNG.

Eastman, J. R.: Hæmothorax in Gunshot Wounds. *Indianapolis M. J.*, 1918, xxi, 105.

Hæmothorax is a common complication of penetrating chest wounds. It may be sterile or septic. The symptoms of sterile hæmothorax are in general those of pleural effusion. There is percussion dullness, diminished voice and respiratory sounds, and tactile fremitus over the area of effusion, with Skoda's resonance above it. The heart is displaced by hæmothorax on the left. The diaphragm is high from atonic relaxation. There is dyspnœa, hæmoptysis, moderate fever and slight icterus. Differential diagnosis is from pneumonia, pyothorax, pneumothorax, and massive collapse of the lung. In the latter condition there is no displacement of the heart.

The treatment is immobilization of the chest, rest, and aspiration of blood. If there is mechanical embarrassment from effusion, aspiration may be performed. Artificial nitrogen pneumothorax to loosen adhesions and promote absorption is recommended in obstinate cases.

The clinical features of septic hæmothorax are a rise in pulse and temperature, pain, tenderness, insomnia and delirium. The signs are those of sterile hæmothorax. The rise in temperature is the most suggestive symptom.

Infection should be suspected in all cases which are not progressing favorably after the fourth day. Treatment consists chiefly in thoracotomy, subsequent irrigation, bismuth paste injections and plastic operations. C. A. HEDBLOM.

Pierson, P. H.: Spontaneous Pneumothorax. *Boston M. & S. J.*, 1918, clxxviii, 385.

The term spontaneous pneumothorax refers to cases of pneumothorax in persons with no demonstrable lung disease. The condition is also referred to as "idiopathic pneumothorax," "latent pneumothorax," "pneumothorax with insidious onset," and "pneumothorax silencieux."

Only 90 cases have been collected from the literature. Three different modes of origin have been described, namely: (1) rupture of vesicular blebs, as large as hen's eggs, in pulmonary emphysema; (2) direct tear of the pleura by a tug on the adhesions; and (3) senile atrophy of the pleura. Tearing by adhesions is the most probable cause, and the presence of adhesions suggests a tuberculous focus as the underlying cause. The rupture often occurs following strenuous exertion, but some have occurred during sleep.

The symptoms are dyspnœa, elevation of pulse-rate, and more or less shock. A history of rather sudden onset of dyspnœa in a healthy individual

with the physical signs of "wooden" dullness or hyperresonance and diminished or absent breath sounds on the affected side indicates pneumothorax. The physical signs suggest fluid; the symptoms do not.

Treatment is absolute rest. The prognosis in these non-tuberculous cases is almost 100 per cent.

Four illustrative case histories are given in detail.

C. A. HEDBLOM.

Morelli, E.: The Treatment of Empyema (Contributo alla cura dell' empiema). *Policlin.*, Roma, 1918, xxv, sez. med., 153.

Since 1910 the author has persistently advocated that the treatment of spontaneous pneumothorax concomitant with pulmonary lesions, no matter how caused, ought to consist in maintaining the pneumothorax at such tension as to immobilize and compress the lung and hence favor cicatrization. This same idea he has applied to war lesions as surgeon-in-chief of one of the Italian hospitals for the special treatment of thoracopulmonary wounds. The Forlanini-Morelli pneumothorax method has been recognized in France and Germany by Duval, Hess, and others.

Having established the efficacy of pneumothorax for the rapid cicatrization of lung lesions, Morelli endeavored to solve the problem of open pneumothorax and the empyema which almost always follows it. He checked hæmorrhage by rubber balloons which hermetically sealed the thoracic opening and prevented the exit of air from the pleural cavity. He found that blood trickling from the lung into the cavity increased the tension of the air, producing a true pulmonary autotamponade. It was also observed that anatomic closure of the thoracic wound often followed the artificial closure without the production of empyema. Recently in 22 cases of open pneumothorax Morelli was able to close 12 without empyema.

In order to reduce empyema he had previously laved the pleural cavity with Gianettasio's chlorosol after thoracentesis. This he found satisfactory. Early and systematic collapse also reduces the chances of occurrence of empyema in lung lesions. But even with these preventive means empyema may develop. In established empyema the treatment can only be pleurotomy, or better, thoracotomy unless the empyema is concomitant with a low situated open pneumothorax. By evacuating the pus there is always improvement, but recovery is slow. Also in the majority of the cured cases there are anatomical alterations and strong diminution of the pulmonary function.

Forlanini as far back as 1880 published a work on the treatment of pleural empyema which Morelli says attracted little attention, probably because it was written in Italian. Forlanini demonstrated that the effusion should be evacuated and air substituted for it and that pneumothorax should be maintained then in constant decompression until the lung dilated and the pus was eliminated.

This method has now been applied to war wounds by Morelli after making some necessary modifications owing to the existence of a traumatic thoracotomy. He uses inflated rubber bags to stop the thoracic opening and obtain a hermetic closure. A drain tube passes through. His apparatus for evacuating the pus and supplying air to the pleural cavity is described in detail and illustrated. In treating a wound with a pneumothorax so largely open that there is no hope of avoiding empyema, he applies the rubber inflated bag to the breach and maintains a positive pressure in order to obtain cessation of hæmorrhage and effect cicatrization.

After ten days of compression the pneumothorax is reduced to atmospheric pressure for five days more. After fifteen days cicatrization may be presumed to have occurred and only then ought aspiration of the lung to be commenced. There is rapid improvement and if the empyema is recent, if the pulmonary destruction is not severe, recovery is always without any thoracic deformity and with excellent functioning. The rubber bag is left in site as long as possible; at first it should be changed often, but later on every four or five days. The sac can be maintained well in its place by the use of adhesive strips, and it can be protected by a covering of wire mesh. The closure of the thoracic breach may be expected in about fifty days or less.

By compressing the lung, by thoracentesis and pleural lavage, and by hæmothorax balloons, Morelli has reduced the number of empyemas to the point that in 85 cases of certain pulmonary lesion with closed thorax he has had only 2 cases complicated by empyema; and in 22 cases with open pneumothorax, only 6 cases of empyema. In 110 cases with certain pulmonary lesions there were only 5 deaths. This was in an advanced surgical post and the cases were of all kinds just as they arrived from the trenches.

It is important to note that in almost all the cases recovery was obtained with normal pulmonary function. Radiologic and radiographic observation showed that in a large number of cases the return to normal was absolute, anatomic, and functional.

The author's experience with almost 400 thoracopulmonary wounds leads him to assert that expectant treatment of lung wounds should be replaced by very active and early operation. The operative treatment varies according to the case. In Italy the military medical authorities have swung completely to this view.

W. A. BRENNAN.

Holmgren, I.: The Treatment of Tuberculous Empyema. *Nord. med. Ark.*, Stockholm, 1917, i, Inn. Med., No. 12.

Since 1908 Holmgren has treated tuberculous empyema by thoracentesis. The effusion is withdrawn through one puncture opening and air is introduced at the same time through another. Sutherland has recently described a similar method employed by him since 1910. However large an empyema may be, it can be withdrawn at one

sitting without discomfort or risk to the patient. The withdrawals should be repeated at intervals of about a month, and the effusions will be found to become less and less as time goes on, as well as thinner. The period of time elapsing before secretion of pus ceases varies between one and eleven months.

Holmgren punctures with two fine needles. The pus is aspirated through one while air is simultaneously introduced through the other. The spot for the withdrawal of pus is selected as low as possible, usually in the tenth intercostal space between the posterior axillary and angular lines, and this is first anæsthetized with novocaine solution. The point for the introduction of air is chosen somewhat higher, as in the next intercostal space above. This is also anæsthetized. A Saugman pneumothorax needle is used. Before air is introduced the operator must be absolutely certain that the point of the needle is actually in the effusion and not in the lung. The operator must therefore see matter exude through the needle or, if the intrapleural pressure is less than that of the atmosphere, he must hear air being voluntarily drawn in, before it is fixed to the air tube. This arrangement makes it possible to observe on a manometer the intrapleural pressure during the course of an operation; to regulate it as desired by the pumping of the air, so that the pressure is maintained at a suitable degree the whole time without too violent variations; the final pressure can be arranged as wished. By auscultation of the bubbling air the position of the surface of the effusion can be controlled at any time during the operation. The formation of pus in the puncture channel or of fistulæ occurs very seldom with this technique, possibly owing to the small caliber of the needles.

The prognosis depends in this, as in other methods, mainly upon the extent of the tuberculosis in the lungs. Often the empyema is only the final episode in a tubercular lung affection, so that the mortality must be high no matter what method is adopted. If the state of the lung does not place obstacles in the way of improvement, the prognosis with this method is good, and the patient can usually attend to his occupation during the whole treatment.

Since 1911 Holmgren has treated 28 cases of tubercular empyema with 17 deaths, or 60 per cent mortality. W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Costantini, H., and Vigot, M.: Immediate Operation in War Wounds of the Heart (Opérations immédiates pour plaies du coeur par projectiles de guerre). *Rev. de chir.*, Par., 1917, liii, 383.

The authors remark that in war literature there are but few cases of immediate operation on the heart. They do not think that such lesions are rare, but rather that they are not often diagnosed, especially when the wound in the chest wall is small. Radioscopy gives one characteristic sign of a penetrating heart wound, i.e., the immobility of the edges of the cardiac shadow. The clinical details of some cases are given.

The authors discuss: (1) the symptoms of heart wounds; (2) the route of approach to the heart.

The symptoms of heart wounds are extremely variable and appear to depend on the situation of the injury and the degree of tension of the hæmopericardium. A non-perforating wound of the left ventricle gives a hæmopericardium under very strong tension with signs of angina. A perforating wound of the left auricle gives a hæmopericardium with a slight tension and causes cyanosis as in asphyxia. A perforating wound of the right ventricle may cause a hæmopericardium of medium tension with signs of severe hæmorrhage. An injury of the apex gives only an insignificant hæmopericardium.

Radioscopy is of great importance in the diagnosis of heart wounds. By showing immobility of the heart shadow it indicates a heart injury with certainty. When the projectile is in the thickness of the heart muscle, radioscopy cannot always be relied upon to make it evident. The hæmopericardium in such cases plays a very obscure rôle. When radioscopy does not show a hæmopericardium, the cardiac wound is not dangerous and operation is not urgent. Nevertheless there may be a grave heart wound without hæmopericardium. In such cases the hæmorrhage is into the pleura.

As regards the route of approach to the heart, the authors, while recognizing that there are other ways, think sternal section is the best, and that this should be systematically used unless one is satisfied with a blind and insufficient exploration. When there is a bleeding wound it is necessary to get a good view and sternal section alone permits this. The pleural cul-de-sacs should be respected as much as possible even if, as it happens in many cases, the pleura is already opened. Extensive laceration of the cul-de-sacs is not necessary in order to expose the anterior face and almost the whole of the lateral faces of the pericardium.

The authors discuss the chondrocostal flap method of Fontan; the definite resection of the third, fourth, and fifth ribs; the chondral flap and transverse section and resection of the left border of the sternum; the chondrosternal flap with an external hinge; Tuffier's method of forced separation of the fifth and sixth cartilages. These methods have some advantages and disadvantages. From their experience in the cases operated upon and from experimental cadaver investigations the authors prefer resection of the fourth cartilage and of a segment of the sternum, followed by forced separation. Three centimeters of the sternum are resected. Then by Tuffier's method of separation an excellent light is obtained. The pleural cul-de-sacs can be avoided without injuring them. This, the authors think, is the best method of exploring the heart region. The method has the disadvantage of being mutilating; but the amount of mutilation

is unimportant. Rapid cicatrization may be hoped for. The authors have tried this method on the cadaver only, but think it should be tried on living subjects.

There are two other points to which the authors call attention in connection with heart surgery. These are: (1) the necessity of terminating the operation by a blood transfusion; (2) the use of sharp aneurism needles for suturing the heart wall. If a Reverdin or some other needle is used, there is risk of tearing the heart wall. W. A. BRENNAN.

Guillermo, M. L., and Montoya, J. M.: Suppurative Pericarditis and Pericardotomy (Pericarditis supurado y pericardotomia). *Reperl. de med. y cirug.*, Bogotá, 1917, ix, 115.

The authors report a case of suppurative pericarditis in a boy aged eight years, the result of a traumatism in the precordial region. After clinical observation for some time during which the symptoms did not abate, the authors decided to operate. Under chloroform a transverse incision about 5 cm. long was made starting from the sternal edge along the fifth costal cartilage; and after dissection of the tissues the pericardium was exposed, opened, and a quantity of bloody fluid drawn off; a cigarette drain was placed, and the incision partly closed. The operation occupied thirty-five minutes.

The child was able to get up on the twentieth day, and made a normal recovery.

The authors discuss the case from the point of view of either a purulent pericarditis or simply a pleurisy with consecutive pericarditis.

Pericarditis in the child has an extremely grave prognosis, the immediate mortality being about 60 per cent. Elliot reported only one recovery in 22 cases treated surgically; and Combe states that even with costal resection and drainage the chances of recovery are very slight.

The complete recovery in the present case after operative treatment appears therefore to the authors a sufficient reason for reporting it. W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

George, A. W., Leonard, R. D., and O'Brien, F. W.: The Roentgen Diagnosis of Disease of the Upper Right Abdominal Quadrant. *Med. Clin. N. Am.*, 1918, i, 1007.

The authors give credit for most of the positive advances made during the last ten years in the roentgenologic diagnosis of disease of the duodenum and gall-bladder to American contributors and attribute it largely to the extensive use of the plate method in contra-distinction to the fluoroscopic method employed by continental workers. They give a detailed description of the duodenum and its relation to surrounding structures.

Anatomically the first portion of the duodenum is a constant entity which can always be demonstrated on an X-ray plate with characteristic shape and outline without exception, if it is normal. Any constant defect in contour means a pathologic condition and this condition is practically always ulcer. In simple adhesions the deformity will be found to vary at different times. The second portion of the duodenum, when dilated to any considerable degree, means obstruction somewhere beyond it. Its course may give valuable information relative to gall-bladder disease; when passing outward toward the liver border, then curving to its normal position, this may be considered almost pathognomonic of that condition.

Regarding gall-bladder disease, the authors maintain that the normal gall-bladder cannot be demonstrated roentgenographically, and if it can be so shown, some pathologic change has taken place either in its walls or its contents. Its size, shape, and location are variable. Relative to gall-stones, the authors claim that with proper technique they can be demonstrated by the X-ray whenever present. This technique consists of making oft-repeated exposures of the patient lying prone after he has fasted for at least six hours. Additional information relative to gall-bladder disease may occasionally be obtained from observations of the opaque meal in the intestines. The jejunum may be transposed to the right upper quadrant and contain an unusually large amount of gas. The appearance of the gas-filled hepatic flexure and transverse colon as seen in the six- and twenty-four hour plates made following the barium meal is quite characteristic in gall-bladder disease. It appears on the plate like a sacculation of gas with a faintly limned periphery of barium just above which or impinging upon it can be seen the visualized gall-bladder. ADOLPH HARTUNG.

Syms, P.: Pneumococcus Peritonitis. *Ann. Surg.*, Phila., 1918, lxvii, 263.

From an exhaustive review of the literature the author finds that pneumococcus peritonitis is a definite entity. It may be idiopathic, that is, occurring only as a local manifestation, or it may be the sequel to some previous site of pneumococcic infection, as the lung or pleura, or it may be present as a part of a general septicæmia in which other organs are simultaneously involved.

It is a rare disease which affects particularly children. It is much more frequent in girls than in boys, in the proportion of three to one.

Two varieties are found: (1) general diffuse peritonitis, and (2) an encysted or localized process. Some claim that these are but stages of the disease; others claim that there are two distinct varieties.

Whether the diffuse peritonitis is an early stage or a special form, it represents the period of utmost gravity. Annand and Bowen in analyzing 91 cases found a mortality in the diffuse type of 86 per cent. In the same series in the encysted form there was a mortality of but 14 per cent.

The salient points in the diagnosis of primary pneumococcus peritonitis are the sudden onset, often with a chill, and followed by an extremely high temperature with a high leucocyte count. Diarrhœa is a conspicuous symptom and peritonitis with diarrhœa should always be looked upon as probably of pneumococcic origin. There is lack of localizing symptoms, as compared with the perforative type of peritonitis, and the abdomen is described as having a "doughy" feel. There is marked toxæmia and the patient seems far more ill than the abdominal symptoms would indicate. Bacteræmia is generally present and blood cultures should always be made.

When peritonitis is established, there will be signs of free fluid in the abdomen or of loculated accumulations and distention of the abdomen. This nearly always begins in the lower part of the abdomen and protrusion or perforation at the umbilicus is a late sign which is very characteristic of this disease. When the abdomen is opened, there will be found a characteristic odorless, seropurulent fluid of a yellowish-green color containing great masses of fibrin. It is always very difficult to distinguish between the peritonitis caused by the pneumococcus and that of the streptococcus both clinically and bacteriologically, and undoubtedly mistakes have occurred.

In the encysted form there seems to be no question but that the best treatment is immediate laparotomy. On the other hand, most authors agree that on account of the high mortality, from 86 to 100 per cent, operation is not the proper treatment when the peritonitis is generalized and the toxæmia is severe. Under such circumstances the treatment should consist in open air, general support, the Fowler position if the pulse will stand it, and proctoclysis. The author believes that the serum treatment should have the same place there that it has in pneumococcus infections elsewhere.

GATEWOOD.

Thun, H. von: Sliding Hernia. *Nord. med. Ark.*, Stockholm, 1917, i, Kirurgi, No. 18.

It may happen in cases of so-called dry hernia, or in cases where the hernial sac and its contents have become intimately adherent to each other, that the serosa of the intestinal loop in the sac may be scarified during operative manipulations. Generally an experienced surgeon will know in which layer he is working, but it is possible that he will find himself in loose connective tissue where nothing particular is found, when suddenly the knife will slip into the lumen of the intestine. As a rule in such cases the surgeon has been operating in the mesentery which emanates from the wall of the hernial sac, while the sac itself is formed more or less by mesentery plus intestine plus parietal peritoneum, or it may be that there is no sac at all. Such cases formerly were called herniæ without or with only a partial sac, but during recent years they have been called sliding hernia, or what the French call hernia "*par glissement.*" The characteristic features of these herniæ is that part of the suspension of the intestine either with or without the mesentery is found in the sac itself. Whether it is a case of true sliding from the peritoneal cavity or a descent like that of a testicle is not known.

Three varieties of sliding hernia may occur. In the first type there is an intestine with mesentery, this latter emanating from the hernial sac and its vessels passing into the sac. Thus the surgeon may enter the intestine by the incision without having passed any peritoneal surface and may injure the nutritive vessels of the intestine. In the second type the intestine is found without the mesentery in the wall of the sac. The risk of injuring the intestine is here much greater. In the third type no part of an intestine covered with serosa is in the hernia, but only a projection of part of an intestine without serosa. This last form is extremely rare.

As regards the sections of intestine involved in the sliding hernia, the author says that the lower part of the ileum might slide down into a hernia not covered with serosa. But as a rule the sliding hernia involves the colon. It is by no means rare that the cæcum, appendix, or the lower part of the ascending colon are attached to the hernial sac in such a way as to lead to the surmise of the existence of a sliding hernia. Similarly with a left hernia a portion of the sigmoid with or without mesentery may slide down, including vessels and mesentery root.

By far the greater number of sliding herniæ are inguinal. In examining the case records of 550 herniæ the author has found 9 unquestionable cases, of which he personally observed 6 cases. Six of the nine cases were left inguinal herniæ containing part of the sigmoid; 3 were right inguinal hernia containing the cæcum and adjoining parts. All the cases occurred in males. In two of the cases an injury of the intestine occurred during operation.

The surgical difficulties in these cases do not alone consist in avoiding injury to the intestine or its vessels, but in the closure of the hernial orifice. The method which the author has found most satisfactory is to loosen the connective tissue in which the intestine is embedded, remove superfluous peritoneal material, suture the peritoneum with tobacco-pouch sutures; or, if this appears to cause too much strangulation, then by a continuous or knotted suture. Then the hernia orifice is closed in the usual way.

W. A. BRENNAN.

Hotchkiss, L. W.: Observations on the Treatment of Direct Inguinal Hernia in Adults. *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

From a study of a reasonably large number of recurrent direct herniæ in hospital practice, the

author has reached the conclusion that, as a class, they are often carelessly operated upon, and that the recurrences are more frequent than was generally known.

He found, in an examination of a number of recurrent herniæ which he had repaired, that the recurrence had, in a large proportion of cases, been due to an overlooking at the original operation of a small direct hernial sac which was to be found, in a large number of primary cases, lying to the inner side of the deep epigastric vessels and constituting always a potential, and commonly an actual, direct hernia, which was often overlooked by operators who were not careful to expose the whole neck of the hernial sac in every case and include it in the ligature flush with the parietal peritoneum.

Attempting to use some one method of repair in all cases, rather than trying to find, if possible, some method which was adaptable to the individual case, would also account for a certain number of cases of failure in the hands of routine operators.

The whole subject is worthy of careful study, and a careful review of methods and results.

In cases of direct inguinal hernia, the weakened, bulging transversalis fascia is the structure which needs bolstering up. Various methods had been proposed, but the author found that the aponeurosis of the anterior sheath of the rectus muscle split and sutured carefully to Poupart's ligament from the pubic spine outward as far as practicable had served well to replace the deficient weakened fascia transversalis, and had given reliable and lasting results. A vertical incision is made through the sheath of the muscle and a flap is fashioned which can be easily turned outward so that its outer edge comes readily in contact with Poupart's ligament, where it is securely stitched with chromic catgut. In cases where the relaxation of the tissues is marked, the principle of the overlap is further utilized with the external oblique aponeurosis and the cord is brought out in the subcutaneous fat.

Rayner, H. H.: Reduction en Masse of a Strangulated Direct Inguinal Hernia. *Brit. M. J.*, 1918, i, 258.

The patient three days previously had begun to have pain in the abdomen and right groin, accompanied by vomiting and the appearance of a lump in the right groin. The swelling was tense and the size of a tangerine orange, yielding no impulse on coughing. It was clearly a strangulated hernia and with gentle manipulation was easily reduced. The patient felt relieved for a time, but during the night and the next day she was uncomfortable, had occasional slight colic, and vomited twice. The bowels had not moved nor had there been passage of flatus. On the fourth day there was slight abdominal distention.

Laparotomy was done which disclosed a loop of small intestine, four inches in length and about three feet above the ileocæcal junction, tightly strangulated in a peritoneal pouch which proved to be a direct inguinal sac displaced from the inguinal canal into the abdominal cavity. By dividing the orifice of the sac the loop of strangulated intestine was released; at its point of entrance into the sac the loop showed a narrow annular strip of gangrene, which was covered over by an invaginating suture. The patient left the nursing home within three weeks and is now in good health. V. C. HUNT.

Stapelmohr, S. von: Primary Sarcoma in the Omentum Majus (Ueber primare Sarcome im Omentum majus). *Nord. med. Ark.*, Stockholm, 1917, i, Kirurgi, No. 21.

The author presents a detailed study and review of the literature on omental sarcoma; he reports a personal case of angiosarcoma in the gastrocolic ligament in a man forty-eight years old. The man was operated upon by marsupialization of the cyst. This was not removed on account of the patient's condition. He died of pneumonia and heart failure three days later.

The author gives as a summary of his study:

1. Forty-nine cases of omental sarcoma, including the present case, have been published up to date; the ligamentum gastrocolicum is included with the omentum. The porportion of women to men is about three to two.

2. The most common type is the spindle-cell sarcoma; next come myxo-, round-cell, angio-, fibro-, mixed cell, and lymphosarcoma in the order named.

3. Angiosarcoma occurs usually after the age of fifty years; the age in other types usually is under forty years. The female sex is more prone to angiosarcoma, whereas myxosarcoma is usually met with in males.

4. Sarcomata may be circumscribed or diffuse. Fibrosarcomata and spindle-celled sarcomata are generally circumscribed. Angiosarcoma is mostly diffuse.

5. In 7 of the cases the sarcoma was in the ligamentum gastrocolicum; usually it is the omentum. In four cases the tumor was pedicled, the pedicle being twisted in two of these. In three cases the tumor was located in a hernia sac.

6. These tumors are in general very rich in blood and tend to a cystic condition by necrosis.

7. Circumscribed tumors may reach a weight of 18 kg., the diffuse type being much smaller.

8. Fibrosarcoma as a rule is the smallest type. Ascites do not occur in more than 50 per cent of the cases; it has been observed in almost 43 per cent. Angiosarcoma is usually associated with ascites; fibrosarcoma rarely. In more than one-third of the ascites cases, the ascitic fluid was mixed with blood.

9. Metastases occur in most of the diffuse types. Fibrosarcoma shows the least tendency to metastasis or recurrence; while angiosarcoma shows the greatest.

10. In 50 per cent of the reported cases adhesions were found.

11. A period free from symptoms, varying from five months to two years, may occur in omental tumors. After this there appear lassitude, loss of flesh, abdominal pain, stomach and intestinal disturbances, a palpable stomach tumor, and occasional urinary troubles.

12. The abdominal pains may be due to adhesions, but like the stomach and intestinal disturbances may be due to the growth of the tumor with stretching and dislocation of the abdominal organs.

13. In most instances the tumor may be palpated beneath the abdominal wall. As a rule it appears in the umbilical region, but it may when pedicled or when very large involve the lower part of the pelvis.

14. Circumscribed tumors before they become too large are more amenable to removal than the diffuse type; however, owing to adhesions they are more or less irremovable.

15. In 70 per cent of the female cases circumscribed tumors were mistaken for abdominal tumors. In 6 cases the diagnosis was an omental tumor, three being diagnosed as sarcoma. None of the other cases were correctly diagnosed.

16. Diagnosis is always uncertain. The Péan symptom-complex, either with or without the addition of ascites, was not present in any case. In diagnosis also the question of operability has to be considered.

17. The duration of the disease prior to operation averaged about nine months. In 11 cases good results were reported after operation; of these 4 were observed to be free from recurrence for more than a year, and one for eight and a quarter years. Round-celled, fibro-, and spindle-celled sarcomata may be cured radically by operation if the tumors are circumscribed and pedicled; a diffuse myxosarcoma was operated upon successfully and remained free from recurrence after three years.

18. The fibro- and angiosarcomata appear to be different in their propensities. Fibrosarcoma is circumscribed, and ascites is usually absent; there is but slight tendency to metastasis or recurrence; the duration is longer. Angiosarcoma is mostly of the diffuse type, and there is usually ascites; there is a tendency to metastasis or recurrence, and the illness is short before death intervenes. The prognosis of angiosarcoma is therefore considerably worse than in the case of fibrosarcoma; and it may be added that angiosarcomata usually appear in more advanced age.

19. Ascites may be present in omental sarcomata; the prognosis is not on this account bad, and even a bloody ascites need not give an absolutely bad prognosis.

20. Removal of the tumor should be attempted; if it is large or diffuse, the whole omentum may be removed.

21. Removal of the omentum or an extended omental resection may not give greater protection against recurrence than removal of the tumor with smaller omental resection. W. A. BRENNAN.

Chueco, A.: Large Mesenteric Cyst Removed by the Vaginal Route (Voluminoso quiste hidatidico del mesenterio extirpado per via vaginal). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1918, ii, 87.

Chueco attempts to show that any abdominal or pelvic tumor which fulfills the two essential conditions of being reducible and exteriorizable may, whatever its size, be removed by the vaginal route. In the case reported, a tumor the size of a fœtal head at term apparently joined to the uterus in the region of the cervix was diagnosed as an interstitial uterine fibroma.

On making an interior colpotomy and enlarging the operative field, loops of intestine were found in the vicinity of the uterine neck and on further search, after destroying adhesions and exerting downward pressure on the external abdomen, a cyst was found strongly implanted in the mesentery. It was evacuated by a trocar, exteriorized, and enucleated through the vagina. W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Jones, N. W.: Achylia Gastrica and Chronic Connective Tissue Lientery; a Clinical Study of 322 Cases. *Am. J. M. Sc.*, 1918, clv, 335.

The author defines connective tissue lientery as the presence of abnormal amounts of undigested connective tissue in the stools.

He reports 245 cases of achylia gastrica not associated with cancer or other wasting disease.

The greatest incidence is during the child-bearing age in women, and forty to sixty years in men, during the period of greatest stress. There were 96 males and 149 females; 132 cases were of asthenic build, while 113 were broad; 182 of the whole series were really asthenic.

Generally speaking, the asthenic group generally had low stomachs, with long emptying time, and were usually constipated, while the symptoms were very like those complained of by neurotics with normal gastric chemistry. Connective tissue lientery was found in 11 out of 17 cases. As to treatment, this group had to be cured of the neurasthenia as well as of the gastro-enteric condition before they were symptom-free.

The broad group usually had a rather short emptying time, and diarrhœa was more common than constipation. Connective tissue lientery was present in 8 out of 11 cases. Besides the gastro-intestinal symptoms, this group complained of headaches, muscle and joint pains, toxic symptoms.

On proper diet these cases quickly responded and were seen symptom-free, and could often return to a meat diet without further difficulty.

As to treatment, the food should be well cooked and finely divided. Connective tissue should be avoided. Hydrochloric acid helps some cases, but makes others worse.

The asthenic patients must have proper treatment for that condition. The prognosis in many cases is good. H. J. VAN DEN BERG.

Finochietto, R.: Precolic Gastro-Intestinal Anastomosis (Anastómosis gastro-intestinale precólicas). *Rev. Asoc. méd. argent.*, Buenos Aires, 1918, xxviii, 88.

One of the complications which may arise after anterior gastro-enterostomy is the creation of peritoneal orifices in which the intestine may become incarcerated. In all precolic gastro- intestinal anastomoses, even in simple anterior and posterior gastro-enterostomy as well as in the Polya-Mayo technique, the loop of small intestine and its mesentery on the one side and the stomach, colon, and transverse mesocolon on the other form the boundaries of an orifice in which the small intestine may be occluded. The author gives some figures to illustrate the mechanism by which this occurs.

Finochietto thinks that in anterior anastomosis the first stage ought to consist in the fixation of the great omentum and transverse colon to the large curvature. The loop which is anastomosed to the stomach should be only long enough to reach the anterior face of that organ, i. e., 15 to 20 cm.

If the mesentery is very short, it is only necessary to seek a point situated about 50 cm. from Treitz's fossa and expose and section the mesentery there as much as may be necessary to give the loop the desired dimensions.

In anastomosing the viscera special care must be taken not to produce rotation of the loop around its mesenteric insertion. The incision of the intestine ought to be limited to its right face and not include its free border, as this border is preserved for fixation in the anterior serosa.

The anastomosis being completed, the prevertebral part of the orifice is closed as far as possible by continuous sutures. This puts the head of the mesentery in contact with the transverse mesocolon and further on with the anterior face of the colon. This suture scarcely complicates the operation and will always be a factor of safety. It ought to be a part of precolic anastomoses. W. A. Brennan.

Kerr, N.: Triple Wounds of the Stomach from a Single Intact Bullet. *Illinois M. J.*, 1918, xxxiii, 267.

The author cites two instances in civil life where a single bullet made three perforations in the stomach. This result is due to the three contraction waves, each of which becomes quite deep as it passes toward the pylorus, thus making it possible for a bullet to graze or even perforate the tip of an inverted crest as it passes through.

In the first case, described by Woodson, in the *Nashville Journal of Medicine and Surgery* in June, 1896, the bullet entered the patient's left side below the apex of the heart. Operation which occurred about sixteen hours after the injury showed that the bullet had entered the cardiac end of the stomach and in doing so had severed the gastro-epiploica sinister artery.

After the wound in the stomach was sewed up, two more openings were discovered when the stomach was turned over to the right as far as possible. The stomach was supposedly empty. Prompt recovery took place after operation.

In the second case, that of the author's, the bullet penetrated the stomach of the patient after he had eaten a full meal. After entering the pelvis of the kidney, the bullet divided the right ureter, then made three perforations of the right portion of the stomach about two inches to the left of the pylorus, one in the posterior wall, one in the anterior just opposite, and another on the smaller curvature just above the line of the other two. The wound on the smaller curvature just above the line of the other two was overlooked, causing the patient's death twenty-four hours later. F. P. Hammond.

Pybus, F. C.: Acute Intestinal Obstruction Due to Jackson's Membrane. *Brit. M. J.*, 1918, i, 258.

The patient, aged forty-one, was admitted to the Royal Victoria Infirmary on January 18, 1916, with symptoms of acute intestinal obstruction.

For some years she had had attacks of abdominal pain and also marked constipation. Three weeks before admission the pains had become worse, she vomited occasionally, and had increased difficulty in getting the bowels open. For a week the pain had been severe, vomiting incessant, and there had been no action of the bowels, while flatus had not been passed for three days.

The abdomen was moderately distended and peristalsis could be felt and seen. On January 18 the abdomen was opened and free fluid escaped on opening the peritoneum. A tense cyst was found in the left iliac fossa extending into the pelvis and the tænia coli distinguished it as the cæcum. It was punctured and a Paul's tube tied in; after evacuating its contents the cæcum was sutured to the margin of the incision. The distention subsided and the bowels moved normally.

On February 2 the abdomen was opened in the midline below the umbilicus. The lower portion of the ascending colon was mobile and was covered by a thin membrane, at the upper border of which was a tight band passing from the parietal peritoneum to the inner border of the colon. The band tightly puckered the ascending colon. It was removed and part of the membrane stripped away. The cæcostomy opening was dissected free from the skin, closed, and the cæcum returned to the abdomen. The appendix was normal. The patient was discharged from the hospital February 17, 1916.

In August and October, 1916, she had attacks of pain and vomiting. Should these attacks persist, cæcectomy or short-circuiting may become necessary. V. C. Hunt.

Wright, J. S.: Rupture of the Intestines by Blows upon the Abdomen. *Canad. M. Ass. J.*, 1918, viii, 228.

Injury to the bowel by direct violence to the abdominal wall is possible under the following conditions: First, when the force is sufficient to

carry the abdominal wall back so that the bowel is caught between the object producing the force and the body of a lumbar vertebra. The position of the patient at the time of injury with the body inclined forward and a weak, flabby abdominal wall would predispose to this form of injury.

A second possible condition in which rupture of the bowel might occur is when it is filled by a solid or semi-solid matter that offers sufficient resistance to ruptu e the gut before it can recede from the oncoming object producing the sudden blow.

A third possible condition is that rupture may occur by reflex stimulation of the intestinal nerves through the nerve supply of the abdominal wall.

Rigidity of the abdominal muscles, pain of a severe type, a strained and anxious countenance, a varying degree of shock, and a rapidly increasing pulse-rate are sufficient signs to lead to a diagnosis and to indicate immediate operation. Treatment in these injuries is purely surgical, and the chance of recovery is in inverse ratio to the number of hours intervening between the time of injury and the opening of the abdomen. E. B. FREILICH.

McDonald, A. L.: Meckel's Diverticulum as a Cause of Surgical Lesions. *J.-Lancet*, 1918, xxxviii, 259.

On the basis of a somewhat extended review of recent literature, the author feels that certain facts can be established and certain suggestive conclusions drawn. These conclusions are as follows:

1. Meckel's diverticulum is a definite structure, and when present shows a characteristic group of possible clinical conditions.

2. Certain anomalies of the umbilicus depend on the persistence of portions of the vitelline duct, and in a considerable proportion of cases, are associated with intra-abdominal anomalies.

3. The history of such umbilical conditions in infancy is extremely important in suggesting the possibility of a Meckel's diverticulum as the cause of obscure abdominal conditions later in life.

4. In the absence of previous abdominal inflammatory lesions, bands causing intestinal obstruction should be examined most carefully for Meckel's diverticulum and treated accordingly.

5. Intussception in older children and adults, the variety developing high in the ileum and compound forms, are frequently due to inversion of a Meckel's diverticulum, forming an intestinal polyp which may be easily overlooked.

A recent case of a male child, eight weeks old, which came under the author's observation and operation, is reported in full. E. C. ROBITSHEK.

Pinkham, E. W.: Ileus Following Gynecological Laparotomies. *Am. J. Obst.*, N. Y., 1918, lxxvii, 614.

The author sets down the following etiological factors for postoperative ileus: (1) mechanical irritation of the peritoneum and intestine during operation; (2) infections of the peritoneum; (3) adhesions of the intestinal loop to abraded surfaces or to adhesion strands; (4) closure of mesenteric vessels.

His conclusions, based upon experience at the Woman's Hospital, New York, are as follows:

1. The postoperative distention which is nearly always present is likely to be a signal of danger and not a condition to be ignored.

2. Differential diagnosis is not sufficiently important to demand even one hour of delay in therapeusis.

3. The greatest source of danger in ileus is the vicious secretion of the upper small intestine caused by the failure of glandular interaction and dehydration by vomiting.

4. A strict prophylaxis includes pre-operative care, as well as a most careful attention to perfect technique at operation.

5. Early treatment at the end of twenty-four hours is indicated and early operation if non-surgical measures fail.

6. The upper bowel should always be drained and not merely punctured, the radical cure being postponed unless the patient's condition allows an extended operation. CAREY CULBERTSON.

Laplace, E.: The Interrelation of Appendicitis, Cholecystitis, and Pancreatitis. *Penn. M. J.*, 1918, xxi, 518.

In 1885 Pasteur demonstrated that an infectious micro-organism may have a different identity morphologically and biochemically without any change in its visible characteristics.

The effect of the infectious micro-organism upon the different tissues according to various media at different temperatures and in varying conditions of humidity increases in virulence, becomes more pathogenic and develops selective affinity. Accordingly, pathogenic organisms of very reduced virulence are used as a vaccine, whereby antibodies are produced conferring immunity against infection by the more virulent form. Thus the effect of vaccine and preventive inoculations.

Streptococcus and staphylococcus are the micro-organisms which find suitable soil in the tissues and disintegrate—the serum locally producing a toxin fatal to leucocytes. Local gangrene results when a wound is allowed to retain its pus, and observation suggests the constantly varying virulence of the streptococcus until it assumes its most virulent type. The virulence varies in passage through the bodies of different animals, and the various organs of an animal body considered as a culture soil can give the streptococcus an identity so special to a given organ that, being inoculated into another animal of the same species, it would select that particular organ as a culture medium, thereby reproducing the same disease in the second animal.

The possibility of a selective affinity of the typhoid bacillus for Peyer's patches in typhoid fever is suggested. These patients remain typhoid carriers for a long time and are prone to gall-bladder infections which predispose to gall-stones and may react as

an irritant on the gall-bladder wall and light up a new acute infection. The gall-bladder more often, however, becomes infected through the blood.

Gall-bladder infections predispose to pancreatitis and cholecystitis. The arrangement of the cæcum in connection with the appendix predisposes to cholecystitis. The infection may start with the bacillus coli and be complicated later with the streptococcus. If the infections start in weak and non-resistant subjects, they cause the acute form of appendicitis requiring immediate operation. When the local intestinal stasis has produced an infection of low virulence which assumes a chronic type, the streptococcus and bacillus coli may find selective affinity for the gall-bladder, or may nestle in the gall-bladder wall and produce cholecystitis. Thus a chain of infection starting in the ileocæcal region from intestinal stasis predisposes to cholecystitis and ulcers in the stomach and duodenum.

A diseased gall-bladder, which may be judged diseased if the lymphatic glands along the cystic, common, and heptic ducts are found swollen, may produce a subsequent pancreatitis.

A focal infection in the appendix may emerge to localize wherever it finds a selective affinity, in the gall-bladder, pancreas, stomach or intestines.

F. P. HAMMOND.

Desmaret: Enucleation of Rectal Cancers by the Coccygo-Perineal Route (L'ablation des cancers du rectum par la voie coccy-périnéale). *Presse méd.*, Par., 1918, xxvi, 180.

In 1908 Cunéo published his method for removal of cancers of the rectal ampulla, preserving the external anal sphincter. This technique which utilizes the coccygo-perineal route included Kocher's coccygeal method of preserving the sphincter, to which was added the pulling down of the upper intestinal extremity into the anal canal. Desmaret during the past three years has used this method in 21 cases of removal of rectal cancer, and publishes his results.

Rectal cancers may be divided into two great classes: (1) those that can be entirely palpated by the finger, i.e., cancers of the anal canal and of the lower part of ampulla; (2) cancers which can be partly palpated, i.e., those of the middle and high parts of the ampulla. The first class are favorable cases for operation because their extent can be clearly defined. The second class are unfavorable.

In cases where the operability is doubtful, Desmaret makes an exploratory transverse perineotomy. This gives an insight into the degree and extent of the lesions. It should, he thinks, be the first step of the operation for ampullar cancer situated higher than 6 cm., where the finger cannot explore. By this method cancers considered inoperable can be removed; it will also prevent the operator applying the technique of Cunéo to cases where it could only end in failure.

As an anæsthetic ether is always used; but the author thinks that regional anæsthesia would suffice in low-situated cancers. The patient is placed in the inverse perineal position as recommended by Cunéo, the thighs being strongly flexed on the abdomen.

Operation is commenced by dissecting the mucous of the anal canal. When the cancer is high, an exploratory transverse perineotomy is done as stated.

If the cancer is in the canal and appears to involve the sphincter, he commences by perineotomy and a coccygeal incision. Transverse incision from ischium to ischium; isolation of the rectum which is easy or not according as the cancer has contracted adhesions; posterior incision and isolation of the posterior face of the rectum; separation of the rectal tube; opening of the peritoneal cavity; pulling down the terminal part of the ileopelvic colon and rectum; section of the intestine above the tumor; reconstitution of the anal canal and anus by fixation of the pulled-down intestine to the skin of the anal wall; closure of the peritoneal cavity. Each of these steps in the technique is described in detail and illustrated.

The patient is constipated for ten or twelve days following the operation. In all cases where the peritoneum has not been closed, a tampon or drain is introduced through the wound and not sutured. This is changed on the second day; and commencing with the sixth day, lavage with weak oxygenated water, later iodized water, is done. Five to six days are required for cicatrization.

The complications to be feared are peritonitis, rectovaginal fistula, and stricture.

With regard to the author's results; juxta-anal and middle ampullar cancers are benign. Desmaret's statistics include 15 cases of this variety, and there was only 1 death from pulmonary congestion.

In females operation of cancers in the superior part of the rectal ampulla offer a better chance of success than those in males on account of the easier anatomical approach. There were 4 such cases in males. In 2 of these cases it was impossible to complete the operation and the patients succumbed rapidly; of the 2 others, one died of pulmonary congestion six weeks after operation, in the other an iliac anus was necessary after a few months. There were 4 cases of high rectal ampullar cancer in females; 2 of these gave excellent results. One patient died; this was not imputable to the operation but to kidney disease. The remaining patient made a recovery with stricture.

Two recurrences have been observed among 17 cases operated upon since January, 1915, the last occurring in 1917.

Regarding the functioning of the sphincter, in four cases of cancer of the upper part of the ampulla and the rectosigmoid region the results were only mediocre. In cancers of the lower part of the ampulla the functional results were good in 15 cases followed. Stricture was observed in three. The tonicity and contractility of the muscle is, however, never normal.

The author thinks that while these patients, if otherwise operated, might have recovered, yet they would have been condemned to an iliac anus or to total incontinence. He further thinks that rectal cancers occupying the lower half of the ampulla if not too adherent to the neighboring organs ought to be removed by the Cunéo technique and that preservation of the sphincter in all cases should be the absolute rule. W. A. BRENNAN.

Edwards, F. S.: Fistula in Ano; Why Is Operative Interference so Often Ineffectual? *Lancet*, Lond., 1918, cxciv, 673.

The cause of failure to cure anal fistula by operation is due to one of three causes: first, the topography of the fistula is not thoroughly recognized and a part of the track of the fistula escapes division; second, caries of the coccyx or ischium is frequently a cause which escapes recognition; third, tubercle. Only the first cause is dealt with in this article.

If a line is drawn transversely across the center of the anus, external openings anterior to this plane will usually have their openings in the gut immediately opposite, and such fistulæ are straight or simple. Where the external opening is behind this transverse plane, the internal opening will usually be found in the midline dorsally and between the sphincters, and with the forefinger in the rectum the indurated fistulous track can often be felt between the finger in the bowel and the thumb outside. This variety of fistula is often curved and is called a "semi-horseshoe," while a "horseshoe" fistula is merely a "semi-horseshoe" on both sides. Although a fistula anterior to the transverse line described is sometimes branched or multiple, an anterior "horseshoe" fistula is practically unknown.

A "horseshoe" fistula may have many external openings and also more than one internal opening; if so, the internal openings are situated in the midline dorsally, one above the other possibly two or three inches apart. The lower one is situated just above the external sphincter and can be felt as a depression, while the upper one usually projects into the gut and is really a granuloma.

In operating, the dorsal sphincter is divided once only, the branch sinuses layed open into this dorsal incision, and a search made for a sinus running up the bowel at right angles to this main track and joining it just outside the gut where the lateral sinuses meet. A two-stage operation should be done in extensive cases. At the first operation, all sinuses running into the main posterior track are laid open, and a month later the dorsal track into the bowel can be incised. Excision of the fistulous track and suture is not advised.

The success of the operation depends on the after-treatment which can be rendered almost painless by dilating completely the rectal sphincter, then daily dressing the wound by inserting the vaseline-coated finger into the rectum, while the patient is straining as at stool, and with pressure away from the cut, insert gently a gauze soaked in warm boric or biniodide lotion. Do not "plug" the wound, but pack it lightly. From time to time syringe out the wound with silver nitrate solution, 20 gr. to the ounce. The patient should be gotten out of bed early and advised to take walking excercises.

P. W. SWEET.

LIVER, PANCREAS, AND SPLEEN

Mayo, W. J.: The Surgical Treatment of the Cirrhoses of the Liver and Their Complications. *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

The reaction of the liver to chronic irritation of any kind is in the nature of a connective tissue disease. The condition was first observed by Laennec, and called cirrhosis by him because of the tawny yellowish color of the atrophic form. The meaning this term carries is that of a sclerosis which perhaps more nearly represents the actual condition. This connective tissue deposit may be local or general and its morphology varies like the patterns of a carpet. There has been a tendency exhibited by many pathologists to make minute and complicated classifications based on pattern designs. But, if it is borne in mind that the liver cells are all alike, sharing equally in function, and that the natural reaction of the liver to chronic irritants, without regard to kind, is the development of connective tissue, the basic fact will be established, without being lost in a mass of morphologic detail. On the contrary, the response of the liver to acute destructive irritants, whether bacterial, toxic, or chemical, is in the nature of an acute fatty degeneration.

Cirrhoses naturally divide themselves into two fundamental groups: (1) portal cirrhosis, in which the irritants, bacterial, toxic or biochemical, are received from the intestinal tract and from the spleen by way of the portal vein, and in which the connective tissue is deposited about the radicles of the portal vein; (2) biliary cirrhosis, in which the irritants reach the biliary ducts by direct extension of infections, as from gall-stone disease or from hæmatogenous infections, usually portal, but not rarely systemic, such as those following pneumonia, typhoid fever, focal lesions, etc., and in which the connective tissue deposit is related to the biliary ducts. The many varieties of cirrhosis described are to be looked on as variations and combinations of these two main divisions.

Advanced portal cirrhosis gives rise to clinical symptoms which depend to a large extent on portal circulatory obstructions shown by the ascites, and the frequency of gastric hæmorrhages. Local portal cirrhosis may give rise to few symptoms. Jaundice is absent or a terminal condition.

Advanced biliary cirrhosis, on the contrary, depends on infections in the biliary ducts, and jaundice is an early, prominent, and often continuous feature. Ascites is absent or a terminal manifestation. Localized biliary cirrhosis may produce few symptoms.

It would appear that biliary cirrhosis is recognized

only as the late stages of a relatively frequent liver condition when more or less permanent damage to the liver tissue has taken place.

The spleen will be found to be enlarged in a high percentage of both portal and biliary cirrhoses, and it seems altogether probable that in a certain number of cases this enlargement is primary and causative. However, it is quite probable that in many cases the enlarged spleen may be a secondary manifestation of disturbed portal circulation, and that the consequent inability of the spleen to rid itself of the toxic products strained from the blood is the cause of the splenomegalia. Certainly it is often difficult to determine whether a given case is one of primary portal cirrhosis with secondary enlargement of the spleen, or of primary splenic enlargement with a secondary cirrhosis. Perhaps the nomenclature depends to a certain extent on which condition the diagnostician discovers first, that of the liver or of the enlarged spleen.

In the series of 52 cases of splenectomy for splenic anæmia, there were a number in which the liver showed portal cirrhosis. In five advanced cases, the ascites completely disappeared, and the patients gained so greatly in strength as to become well to all intents and purposes, and they have been able to work for a number of years. When it is considered that the splenic vein under normal conditions is about one-sixth the diameter of the portal vein and that in the enlarged spleen the vessels are correspondingly increased in size, it will readily be seen that the removal of the spleen in suitable cases affords a quick and certain method of relieving the portal circulation. The greatly enlarged spleen was removed in five cases of portal cirrhosis; two were of the alcoholic type. One patient died too soon after the operation to show any benefit, but the other four were very greatly relieved. As the operation of splenectomy which prevents the blood from reaching the portal vein is not one of great difficulty, it would seem to be even superior, in suitable cases, to the Talma-Drummond-Morrison method of diverting the blood from the portal to the systemic circulation through the venous compensatory channels of Sappey.

The relief of the portal circulation by reducing the amount of blood which enters the liver may also be readily and safely accomplished by the ligation of the inferior mesenteric or superior rectal vessels. A small incision is made through the peritoneal covering of the right side of the sigmoid mesentery, and the vessels are doubly ligated and divided with resuturing of the peritoneal incision. Considerable experience in such ligations, made in connection with a permanent colostomy as the first step of a two-stage removal of the rectum for cancer, has shown that an immense collateral circulation is established through the middle and external hæmorrhoidal vessels, and that the bleeding at the second stage done two weeks later is so greatly increased as to become troublesome. The coronary arteries of the stomach could be ligated safely but in the cirrhoses this procedure might increase the ever-present danger of gastric hæmorrhage.

The Talma-Drummond-Morrison operation was performed twenty-eight times, with four deaths. Eight of the patients have died at various dates following operation, the remainder were more or less benefited; five only are in good condition. Investigation of the cases showed that good has resulted, particularly in the cases of non-alcoholic cirrhosis seen in the young, but generally speaking, the results have been disappointing. Various techniques have been employed. In a few cases subcutaneous silk drains were placed with one end entering the peritoneal cavity. In two instances the internal saphenous vein was employed in the same manner. The easiest and safest method is to make a Bevan incision, as for gall-bladder work, drawing the omentum up through the peritoneum into the rectus muscle, suturing it in that position, and closing the fascia carefully over it. On several occasions in going down a second time in the vicinity of the previous incision with a view to increasing the omental attachments, such extensive compensatory circulation, almost entirely venous, was found that it was necessary to desist and the hæmorrhage even was controlled with difficulty.

Biliary cirrhosis dependent on infections from gall-stones will usually be found complicated with chronic pancreatitis and enlargement of the spleen. The remedy which suggests itself is removal of the gall-stones and drainage of the biliary ducts. In several instances, when it seemed indicated, prolonged drainage of the gall-bladder was instituted. This apparently has been of great benefit to the patient and suggests that the source of bacterial infection was in the gall-bladder. Of late years cholecystogastrostomy or cholecystoduodenostomy has been done in selected cases and has proved equally as efficient as, and less troublesome than, the cholecystostomy. Some of the patients have been greatly benefited; many have had coincident pancreatitis which interfered with common-duct drainage, and some part of the improvement may have been derived from relief of this interference.

A large spleen connected with advanced biliary cirrhosis was removed in five instances, and the results were extraordinarily good. While none of the patients have been entirely relieved of the jaundice, and the liver has not returned to normal size, all have improved greatly.

In conclusion, the feasibility of reducing the portal circulation in suitable cases by splenectomy and similar procedures, thereby relieving the subnormal liver of its overload, is emphasized.

Fischer, I. F.: Examination of Gall-Stones by Roentgen Rays. *Nord. med. Ark.*, Stockholm, 1917, i, Kirurgi, No. 12.

Renal calculi as a rule are more dense than gall-stones, and produce a much stronger shadow on the roentgen plate. Also the anatomic location of gall-stones prevents them from appearing on the plate.

In the Bispebjaerg Hospital, Copenhagen, for the past four years all patients presenting symptoms of gall-stones have been examined by roentgen rays. The patients numbered 141. The roentgenograms were positive in 11 cases. Of these 8 were operated upon but stones were found in 6 only. Of the 141, 54 patients were operated upon and stones were found in 39. The low positive number of cases in which shadows of stones were seen on the photographic plate shows very clearly that no weight whatever should be attached to the negative result of the roentgen examination, which showed calculi in only about 8 per cent of those examined. Even in 3 of the cases in which a positive roentgenogram was verified by operation, the number of stones found greatly exceeded those shown on the plate. This is accounted for by the fact that the calculi present in the same gall-bladder have different powers of absorption for the roentgen rays.

The author gives a number of illustrations of the appearance which gall-stones give on the plate. He also describes the errors which might be made in interpreting these shadows. The calcareousness of the stone and not its size is the determining factor in the vividness of the shadow cast on the plate.

Experiments show that no small part of gall-stones embedded in a gall-bladder with abundant gall will not be demonstrable by the roentgen rays, because their chemical composition gives them less power of absorbing the rays than that possessed by the liquid. It is impossible to fix a limit of the percentage of gall-stones the demonstrability of which is within the margin of possibility. It will depend on the technique applied. Any improvement of technique will improve the roentgenologic diagnosis of gall-stones. W. A. BRENNAN.

Judd, E. S.: The Recurrence of Symptoms Following Operations on the Biliary Tract. *Ann. Surg.*, Phila., 1918, lxvii, 473.

Recurrences of symptoms following operations on the biliary tract are much more frequent following drainage of the gall-bladder than after its removal. From a review of 2,027 case histories of patients operated upon at the Mayo Clinic in the past two years for biliary conditions, 219, or 10.8 per cent, were secondary. Eighty per cent of the operations were for the removal of the gall-bladder, which has been accepted as the operation of choice, as it has been definitely shown that this reduces the risk of later troubles and ordinarily is to be preferred to cholecystostomy for drainage.

In these secondary operations the mortality was only 0.8 per cent, or no higher than in a series of primary operations. The mortality from drainage was higher than from removal, but this was due to the fact that only those cases were drained in which the patients were poor risks or where there were technical difficulties which did not make a removal possible at the time of operation.

Infection of the liver, gall-bladder, or ducts is the most frequent cause of secondary trouble, and may recur many years after the primary operation. The recurrence of stones is more frequent in the gall-bladder than in any other part of the biliary tract. The common duct is next in point of frequency, although in a small percentage of cases stones will be overlooked in the common duct and give the symptoms of re-formation at a later date.

GATEWOOD.

Scalone, I.: Splenectomy for Necrotic Spleen After Gunshot (Sopra una splenectomia per ferita dell'ilo con necrosi della milza, trombosi intraparenchimale diffusa et extraperitonealizzazione per ematome perisplenica). *Policlin.*, Roma, 1918, xxv, sez. prat., 538.

In the curious case reported, Scalone did a splenectomy on a soldier 28 days after being wounded by a shrapnel bullet. There was presumably a lesion of the splenic vein. The spleen was quite necrotic and found to be outside the peritoneal cavity from which it had been pushed by a large and total perisplenic hæmatoma. There was a diffuse intraparenchymal thrombosis with marked dilatation so as to be almost cystic in appearance. The presence of small foci of infection disseminated throughout the whole spleen explained the presence of a persistent feverish condition. The man recovered.

Scalone finds no similar case in literature.

W. A. BRENNAN.

Elliott, C. A.: Radium Treatment of Leukæmia. *Med. Clin. N. Am.*, 1918, i, 1261.

In the treatment of leukæmia, radium possesses certain advantages over benzol or the X-rays. The general toxic action of benzol is objectionable and its results are uncertain. With an efficient roentgenologist, leukæmia cases may be improved by X-ray, but they remain clearly leukæmic as to blood picture and splenic enlargement.

Radium therapy is more readily applied, has more lasting effects, and more decisive action, and the treatment is necessary only at longer intervals.

Using four 25 mg. lead screened tubes, with one-fourth of an inch of gauze between the element and the skin, the radium is applied to the splenic circumference for two exposures of from four to six hours each the first day.

Changing the application to another portion of the spleen, this is repeated on the second and third days. In thirty days, this course is repeated, and in sixty days only 800 mg. hours may be required.

A case of myelogenous leukæmia is reported, the chief symptoms of which were splenic tumor, with local pain and tenderness, dyspnœa and general weakness, loss of weight, subcutaneous nodules, tingling sensations in the arms, attacks of jaundice, gastric indigestion, and nocturia. Using the radium therapy as above described, the patient experienced gradual relief from pressure because of marked decrease in the size of the splenic tumor, and gained in weight. The white cells dropped from 311,200

on June 19, to 26,800 on November 16. Because of a tendency to enlarge, the spleen was removed December 20.

Radium, in this case, greatly improved the patient's general condition, caused the blood picture to become normal, and reduced the size of the spleen to normal, causing a diffuse corrective increase in in the spleen, and leaving no semblance to the typical leukæmic spleen.

The second case was a myelogenous leukæmia in which radium was applied irregularly from May 26 to June 30, 1917, a total of 6,600 mg. hours. On discharge from the hospital July 3, there was a great improvement in the general condition; blood count was reduced from 294,000 to 33,000, and the spleen was decreasing in size. By March 11, 1918, the spleen was not palpable, the red count was normal, white count was 11,200, and the patient in good health.

The third case was a lymphatic leukæmia, with marked tumor masses in the cervical regions, axillæ and groins, and palpable retroperitoneal masses. The spleen and liver were somewhat enlarged. From January 11 to February 6, 1917, the patient was given seventeen applications of radium, with a total of 6,600 mg. hours. The tumor masses were reduced greatly and showed marked solution. White blood count was reduced from 113,000 to 5,400, with no pathologic cells remaining. When last seen, the condition of the patient was still improving.

The following conclusions are drawn:

1. Radium, as a therapeutic agent in these cases of leukæmia, was more effective than other methods.
2. The white blood cells rapidly approached normal with loss of pathologic cells.
3. Hæmoglobin and red blood count increased rapidly.
4. Pathologic lymphoid tissue decreased rapidly in size, and a section of the removed spleen shows no leukæmic findings.
5. Improvement has been shown in the general health of patients.

V. E. Dudman.

De Lange, C., and Schippers, J. C.: Familial Splenomegaly; a Clinical Study. *Am. J. Dis. Child.*, 1918, xv, 249.

The authors report 7 cases of splenomegaly, all in one family. The ages of the children were from seventeen days to eleven years.

The first case, two years old, had an enlarged liver but no clinical history was obtained.

In the second case, eleven years old, the spleen was enlarged, firm and painless. The left lobe of the liver was enlarged; there was no ascites. The urine contained urobilin. The Wassermann and von Pirquet tests were negative. Hæmoglobin was 70 per cent; red cells, 5,200,000; white cells, 6,800. Differential count gave 64 per cent neutrophiles, 13 per cent eosinophiles, 0.3 per cent basophiles, 16.6 per cent lymphocytes, and 5.3 per cent transitional.

Death occurred suddenly after a serious hæmatemesis.

The third case died seventeen days after birth from umbilical infection.

The fourth case, eleven years old, showed similar findings as in Case 2 except a positive von Pirquet test.

In the fifth case, nine years old, the liver and spleen were not palpable. The blood findings were the same as in Case 2, with the von Pirquet test negative.

The sixth case, seven and one-half years old, showed an abdomen distended with dilated veins. The spleen was enlarged, and the smooth left lobe of the liver enlarged. There was no ascites or jaundice; Wassermann was negative; the von Pirquet was strongly positive. Splenectomy was performed in this case.

In the seventh case, five and one-half years old the abdomen was distended and there was slight dilatation of the veins. The spleen was enlarged, smooth, and not painful. The left lobe of the liver was enlarged. Wassermann was negative, and von Pirquet positive. Splenectomy was performed.

Examination of both parents and three grandparents was made. A relative lymphocytosis was found on repeated examination of the father. Other observations led the authors to believe that these were cases of splenomegaly of Gaucher. Both children operated upon are living. The microscopic examination of the removed spleens showed no pathological tissues except hypertrophy.

I. E. Bishkow.

MISCELLANEOUS

Heyd, C. G.: The Differential Diagnosis of Affections of the Right Upper Quadrant. *Am. J. M. Sc.*, 1918, clv, 703.

The differential diagnosis of affections of the right upper quadrant resolves itself into an interpretation of the various forms of "dyspepsia." In an analysis of indigestion it is found that approximately 40 per cent are due to disease within the abdomen but arising from other organs than the stomach; that 40 per cent are due to causes entirely without the abdomen, and that in only 20 per cent is there organic disease of the stomach. For all ordinary purposes of diagnosis the history still remains the keystone in the diagnostic arch of affections of the right upper quadrant. Clinically the problem is to differentiate gastroduodenal ulceration, gastric carcinoma, disease of the biliary apparatus, including pancreatitis, appendicitis, and to a lesser extent lesions of the kidney and colon.

In considering affections of the biliary tract the histories of a large number of cases will be found to present a composite picture in which four well-defined pathological stages are evidenced and which clinically may be translated into four sequential clinical pictures: (1) when the disease is confined to the gall-bladder; (2) when there are attacks of biliary colic; (3) when calculous obstruction to the common duct intervenes with jaundice; (4) when as

a result of infection or trauma to the common duct there is an associated or coincident disease of the pancreas.

The early symptoms of gall-bladder disease are vague atypical symptoms of qualitative dyspepsia. Occasionally there is an entire cessation of this indigestion, with prolonged periods of comparative gastric relief. After a variable period of time there is introduced into this picture an acute attack of pain, colic-like in type, with marked predilection for nocturnal occurrence, and usually so severe as to require a hypodermic of morphine. Its marked and distinct characteristic is that it is of maximum intensity, occurs spontaneously, has a short duration, disappears spontaneously, leaving a residual soreness along the right costal margin. When there is a colic associated with jaundice and marked by fever, leucocytosis, and occurring in that order, the diagnosis of calculous disease of the common bile duct can be made.

Chronic pancreatitis is frequently associated with gall-bladder disease and it is claimed that it is a common abdominal complaint and capable of diagnosis. Acute pancreatitis, according to Fitz, begins with intense pain, especially in the upper abdomen, soon followed by vomiting, more or less obstinate, accompanied with obstinate constipation. A normal or subnormal temperature may be present and symptoms of collapse precede by a few hours death which is most likely to occur on the second or fourth day. Pancreatic or biliary carcinoma is characterized by slow but progressively increasing jaundice not associated with colic, chills, fever, sweats, nor leucocytosis, and in its earlier stage usually devoid of pain.

Three facts stand out in the history of all regular cases of peptic ulcer: pain, time relation of pain to food ingestion, and periodicity of attacks. As a corollary to these three is the nocturnal pain of duodenal ulcer and its rather specific type of hunger pain. Variations in symptomatology depend on the localization of the ulcer.

Cancer of the stomach makes its presence known only when ulceration occurs or when there is an interference with motor function of the stomach. There is, however, no isolated or significant sign or symptom upon which the diagnosis of early cancer can be predicated. If there is any symptom that stands out as between ulcer and cancer, it is the known periodicity of symptoms in ulcer and its absence in cancer.

The outstanding features in chronic appendicitis are irregularity, variability and almost entire lack of periodicity of symptoms. E. B. FREILICH.

Hussey, F. V.: Review of 100 Consecutive Cases of Acute Diseases of the Appendix, Gall-Bladder, Duodenal and Gastric Ulcers Which Have Come to Operation. *Rhode Island M. J.*, 1918, xi, 75.

Delay without operation has killed many patients or caused long, painful convalescence with unsatisfactory after-results. The normal rate of mortality in operations for appendicitis should be practically nil when done at the most favorable time, whereas now it is high. Even in cases of disease of the gall-bladder and ulcers of the stomach, it should not be much over three to four per cent.

A hundred cases were selected by the author, 76 cases of acute and 2 cases of subacute appendicitis, 16 cases of acute gall-bladder disease, 5 cases of acute perforated gastric ulcer, and 1 case of acute perforated duodenal ulcer. Of the 78 cases of appendicitis, 23 were of the acute catarrhal type; 22 of these were operated upon with no mortality; 2 refused operation and went home well from the attack. The average time in the hospital for each case was twelve days. Of 46 cases of gangrenous appendicitis, all of which were drained, 3 died. The average length of time in the hospital for each drained case was about three weeks. All cases cited had had one or more previous attacks. The excess of time in the hospital of the drained cases over what it should have been, had they been clean, was approximately ten days to each case.

The most efficacious method of treatment of these acute cases is considered to be rest in bed, starvation diet, no catharsis, ice locally, and operation after a correct diagnosis. The Murphy saline drip has been very efficacious in drained cases following operation in conjunction with the Fowler position.

From the figures quoted, the facts are that a large number of cases have had previous acute attacks or previous symptoms of chronic inflammation; catharsis in the initial stages has been used frequently; operation was on a comparatively late day of the sickness and a longer stay in the hospital of drained cases over the clean was evident.

Of the 16 gall-bladder cases, 12 had previous symptoms. The duration of the symptoms varied from three weeks to twenty years. Thirteen cases were operated upon with a mortality of 5. Of the 6 ulcer cases, 5 of gastric ulcer and one duodenal, 5 gave history of previous trouble, with a duration of from three weeks to eight years. One case of gastric ulcer and the patient with the duodenal ulcer died.

As a preventive to high mortality or serious convalescence, physicians should impress on the patient the seriousness of the condition and urge immediate operation after diagnosis warrants.

F. P. HAMMOND.

Saint, C. F. M.: Abdominal Operations at an Advanced Operating Center. *Brit. M. J.*, 1918, i, 473.

The center was situated in a village in advance of the corresponding group of casualty clearing stations, and because of bad roads an hour's very bad journey was saved.

The accommodation comprised part of a building without any special heating or lighting arrangements. The heating was done by oil stoves and the lighting by an acetylene plant. In the building were the operating theater, sterilizing room, and

postoperative room of twelve beds. Outside were the reception marquee and 38 extra beds. The operating theater was large enough for two tables.

With the exception of the first few days, when a second team was attached, the operative work was done by one surgical team, consisting of the surgeon, anæsthetist, sister and theater orderly. Four extra sisters were attached to superintend the nursing in the wards. At a later period three extra surgical teams were attached to the center, and the beds increased to 75.

Special efforts were made to evacuate the abdominal cases as quickly as possible from the line. When the patient arrived, if he was considered fit for operation, he was washed and undressed, morphine and atropine were administered, and no drinks were allowed. The urine was always examined before operation, and the operation was commenced one hour after the patient's arrival.

If the patient was considered unfit for operation, the usual resuscitation procedures were carried out and the patient made as comfortable as possible, heat applied and stimulants given and saline intravenously; in a few cases transfusion of blood was performed.

If the interval between wounding and admission was more than eighteen to twenty-four hours, expectant treatment was adopted. When the case was judged hopeless, the patient was made as comfortable as possible, morphine was not withheld, and fluids were allowed by mouth.

The anæsthetic administered was chiefly ether, reenforced at times by chloroform, and given by the Shipway apparatus.

The principles observed in operating were: (1) good exposure, (2) minimum retraction, (3) gentle manipulation, (4) speed, consistent with care and thoroughness.

The wound was always excised and the subsequent incision planned to obtain the best exposure of the affected area. Complete exploration was accomplished as quickly and gently as possible and treatment was as conservative as possible. No resection was done unless the affected viscus appeared damaged beyond repair or the risk of hæmorrhage seemed too great. In hollow viscera silk was used and a transverse line of sutures preferred to purse-string in holes in the gut. Intraperitoneal bladder wounds were closed with or without drainage of the extraperitoneal track, and no suprapubic cystostomy was done. In injuries of the solid viscera it was routine to "bipp" all tracks with the object of controlling sepsis. Catgut was always used for suturing. In injuries of the hollow viscera, if the extravasation of contents was small, all that was done was local cleansing and mopping out with 1 in 1,000 flavine. If on the other hand extravasation was great, the peritoneum was irrigated with 1 in 10,000 flavine or saline, and a pelvic drain left in for forty-eight hours.

There was no hesitation in leaving a smearing of "bipp" in any area which appeared soiled. As a routine the incision was "bipped."

When both the chest and abdomen were involved, the essential feature of the operation was dealing with the abdomen through the diaphragm from above; the diaphragm itself was repaired from the thoracic aspect.

Before leaving the theater, if the patients were much shocked, an intravenous infusion of saline was given. The injection which proved most satisfactory was composed of 3 per cent gum acacia, 1 per cent glucose, and 1.9 per cent sodium chloride. On coming from under the anæsthetic, everything was done to stimulate patients. Fluids were urged by mouth or bowel, depending upon the part of the alimentary canal injured.

The average length of stay of patients at the advanced operating center was a fortnight. Of the 50 cases, 33, or 66 per cent, recovered and 17, or 34 per cent, died. The average time of all cases before operation was eight and one-half hours. Excluding one case, which was forty-two hours old, the average was seven and six-tenths hours. The average time among the recoveries was seven and three-tenths hours, and that among the deaths eight and three-tenths hours. V. C. HUNT.

Richards, O.: The Selection of Abdominal Cases for Operation. *Brit. M. J.*, 1918, i, 471.

The percentage of patients who survive operation is no real index of the value of treatment. In a large number of cases injuries are found which no surgery could cure; in others there are minor injuries which would not have proved fatal even if they had been left alone. The only kind of operation which is profitable as well as successful is one in which a fatal injury is cured. These constitute the real successes.

The real failures are the cases in which the patient is wrongly classed as moribund when operation might have saved his life, and those in which a penetrating wound of the abdomen is not recognized as such until it is too late. The difficulty lies rather in the selection of cases, and it is here rather than in any point of technique that most difference exists in the practice of individual surgeons.

Men who reckon every case moribund which has been wounded for more than twelve hours, or has a pulse of 120 will be able to show good statistical results. Those who operate on practically every living patient will waste much energy, and have a high death rate; they will, however, save a few more lives. A hopeless abdominal case is only injured by operation in the sense that life may be shortened by a few hours, while an exploration which proves unnecessary is rarely fatal. But every unprofitable operation means that time is wasted, and that other wounded have to wait longer. Every hour wasted makes the chances of all those waiting for operation definitely worse.

Wounds limited to solid organs, with no progressive bleeding, and no large missile retained, do not usually need operation, and patients with other grave injuries of head, chest, or limbs are commonly unfit to stand it.

In the vast majority of the remainder it can usually be recognized that the abdomen is penetrated. Here the abdomen is opened on the ground that most men wounded in this part of the body die, but that some of them can be saved by operation. Whether operation is necessary or not can only be discovered by exploration, but if it is necessary, the exploration is fully justified. Under these conditions decision in each case must be based on the time elapsed since injury, and the condition of the patient, of which the best index is the pulse.

In this series the time which had elapsed since the injury was recorded in 164 cases; 120 were operated upon within twenty-four hours, and 44 cases later. The recovery in the early cases was 40 per cent and 19 per cent in the later. Of the late cases only 7 had wounds of the alimentary canal, so that out of 19 successful cases operated upon after twenty-four hours only five were men wounded in the stomach or intestine. The rest of the survivors had injuries with hæmorrhage from a solid organ, mesentery or omentum.

In the early cases 80 were operated upon within twelve hours; 33 recovered. Of these 26, or 80 per cent, were wounded in the stomach or intestines. The survivors, with or without operation, are almost all cases whose chief injury is hæmorrhage. Bleeding has by this time ceased and is not necessarily fatal if left alone. In these late cases, then, there is greater chance of performing an unnecessary and unprofitable operation. It seems that operation is very profitable in the first twelve hours and well worth while in the second twelve hours. After this time the chances are that it is unnecessary, even if the patient survives, so that preference should be given to early cases, even if their condition is less good.

The cases may be divided into those with a pulse-rate under 120, and those with a rate of 120 or over. The quality of the pulse is very important. Of 131 cases in which the pulse was counted, in 77 it was under 120, and 54 per cent recovered. Of the 54 in whom it was 120 or over, only 25 per cent recovered.

The objection to risking death on the table is largely sentimental. If the patient is as fit as he is ever likely to be, and has a reasonable chance of surviving the operation, this danger may be faced.

If care is taken to exclude those who have been wounded too long, and those whose condition is too bad, there still remains the danger of failing to include those who have scarcely any symptoms. Minute wounds of the abdominal wall without pain, rigidity or vomiting, are sometimes associated with serious internal injuries. In these cases the results of operation before symptoms occur are very good. To avoid missing these cases it is necessary to explore every wound of the abdominal wall.

A sensible surgeon should be in charge of the pre-operative ward, whose duty it is to decide the order in which cases go to the theater, and, if necessary, the surgeon to whom they are allotted.

Waste of time should be eliminated in getting patients in and out of the theater, anæsthetizing and cleaning them. If there is a sufficient supply of stretcher bearers and if two tables are available for each surgeon, so that he may go from one patient to another, this delay can be obviated.

Speed in operating is important. Provided an operation is gentle and thorough, the quicker it is done the better. V. C. HUNT.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Earl, G.: Bursæ. *Minnesota Med.*, 1918, i, 131.

Anatomically a bursa is not a distinct organ. Histologically, there is a wall of connective tissue with elastic fibers partially or wholly limiting a colloid substance. It may be lined with a pavement epithelium, or a tissue rich in round cells and cells similar to cartilage cells.

One hundred and seventy-five bursæ are listed and in many cases there are multiple bursæ under one name. While trauma was formerly thought to be the all-important factor, increasing recognition has been given to the rôle of infections and other factors as metabolic disturbances. Many of the bursæ connect with the synovial membrane of the joints and are accordingly subject to the same diseases.

Calcium deposits are frequently shown in bursæ, suggesting the diagnosis of bursitis. The chief value of the radiogram is, however, in the exclusion of bony changes. These deposits must not be confused with fragments of bone about a joint.

The treatment of bursæ depends upon their etiology and location. The superficial type lends itself readily to aspiration or excision. In the deep type conservative treatment calls for rest, aspiration, massage, and passive movement. It may be necessary, however, to resort to excision, or in the presence of a pyogenic infection, to incision. The rôle of the focus of infection must not be overlooked, not only in effecting a cure, but as an etiological cause of further disturbance. GATEWOOD.

Kirmisson, E.: Scapular Osteomyelitis (Sur un cas d'osteomyélite de l'omoplate)l *Rev. gén. de clin. et de thérap.*, Par., 1918, xxxii, 132.

A scapular location of osteomyelitis is rare. Statistics show 9 in 661 cases. The author reports a case in a boy aged eight years, developing consecu-

tive to a whitlow of the index finger. Two similar cases are found in literature. The patient has been treated by lavage of Dakin's fluid. If the suppuration does not abate, resection and removal of sequestra will be done. W. A. BRENNAN.

Ramey, R. L.: Report of a Case of Osteitis Fibrosa Cysticus, Involving the Shaft of the Right Femur and Right Tibia. *Texas St. J. Med.*, 1918, xiv, 16.

The author reports in full a case in a child nine years of age. The diagnosis was made chiefly by X-ray.

At operation, the unhealthy tissue was thoroughly curetted out, and the cavity swabbed with half strength iodine and closed. The femur was treated the same as the tibia.

The author reports the child to be in good physical condition at the present time. E. C. ROBITSHEK.

Wobus, R. E., and Opie, E. L.: Elephantiasis; Report of a Case. *J. Am. M. Ass.*, 1918, lxx, 987.

A case of elephantiasis of unknown etiology is reported.

An unmarried woman aged forty had progressive enlargement of the right foot since an early age, which had become progressively worse, with muscular weakness becoming more marked and locomotion more difficult.

Various methods of treatment were of no avail. The leg was amputated below the tubercle of the tibia. Examination of the specimen showed a pendulous mass, completely surrounding the bones of the foot and protruding posteriorly at the calf. Cross section showed a tumor almost completely replacing the gastrocnemius, and consisting throughout of dense white fibrous tissue.

Microscopic examination showed also dense white fibrous tissue poor in cells, especially evident in the immediate vicinity of the blood-vessels. Occasional islands of fat intervened.

The lesion was diagnosed as elephantiasis dura.

V. E. DUDMAN.

Willems, C.: Immediate Active Mobilization as a General Method in Articular Lesions (La mobilization active immédiate-methode générale de traitement des lésions articulaires). *Arch. méd. belges*, 1918, lxxi, 225.

Willems says that no surgical procedure has been so dogmatically established as that of immobilization in articular lesions. Within recent years, however, the teachings of Lucas-Championière, Rochard, and others have done much to replace immobilization by progressive movements. Willem himself who practised immobilization in plaster for twenty-five years has found generally that the results were not brilliant. At the German Surgical Congress of 1908 he reported about 30 cases of hæmarthrosis or traumatic hydarthrosis treated by evacuatory puncture and early mobilization, which attracted a large amount of attention and gained a large number of followers for this method.

The war has opened up a vast field for the application of the method. The technique cannot be invariably the same for lesions which are materially different. Thus immediate walking is impossible in the case of a large knee puncture. The nature of the joint mobilization may vary according to the case, but the general rule is active immediate mobilization. Active mobilization depends upon the patient himself, who must make the physiologic movements of the joints. Such active mobilization cannot be replaced by passive mobilization, which does not involve either the musculature or the nutrition of the limb. Neither should the two methods be combined. Active mobilization should also be immediate, commencing from the time the patient awakes from the anæsthetic. The mobilization should be pushed to the maximum degree of motion possible from the very beginning and continued without respite.

The treatment of articular lesions, therefore, according to Willems, should consist of active, immediate, maximum, and uninterrupted mobilization of the joint. It requires that the patient must continually make the necessary efforts, and he therefore must not be left to himself but must be supervised by a staff conversant with the method.

Whatever may be the extent of the bone lesion, Willems says that mobilization is always possible, although not always in the same degree. It requires courage and perseverance in the patient, but the necessary movements though tiresome do not cause any real pain.

Willems passes in review the various types of articular lesions and shows in what manner and measure the foregoing principles may be applied in each case. The types of lesions reviewed are joint lesions without bone injury; joint lesions with slight bone injuries; joint injuries with medium, and those with extensive bone injuries; cases with extensive losses of substance of one or of both epiphyses; epiphyseal fractures of various types.

The method is only applicable within certain limits of osseous destruction, beyond which it is impossible to preserve the function.

Immediate active mobilization has given the most surprising results in purulent arthritis. Willems states that this new method is infinitely more powerful than any other available means of combating this infection. Drainage of an articulation by the existing methods is, according to the author, impossible; none of the means at disposal ever succeed in accomplishing it in a sufficient manner. To practice resection in such cases is to go beyond the indications.

But after a preliminary arthrotomy, when the patient makes movements which can be done almost without pain, the pus is expelled sometimes in jets. When the movements are continued, the pus is expelled as fast as it is formed and articular drainage is fully and satisfactorily assured. The formation

of peri-articular abscesses is unknown, and the general state undergoes rapid improvement. Articular mobility is also preserved and there is no ankylosis. As the joint becomes dry, the arthrotomy openings are closed up. Movements are not more painful for the patient with purulent arthritis than in the case of a non-infected lesion. When the temperature has fallen sufficiently and while the articulation is still largely open, the patient is made to walk.

In future articles the author will give particulars of cases and statistics. W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Simpson, J. A.: Traumatic Luxation of the Sacro-iliac Symphysis, Without Fracture of the Pelvis. *Ann. Surg.*, Phila., 1918, lxvii, 348.

Simpson reports a case of luxation of the sacro-iliac symphysis combined with separation at the symphysis pubis, in which reduction was accomplished by use of the Hawley table and applied traction, and secured by wiring and by an adhesive plaster band, over which a cast was applied.

Only eleven well authenticated cases have been reported.

Diagnosis of this condition with the X-ray is easy; without it, difficult and uncertain.

On the affected side shortening of the limb is noted when measured from the umbilicus, and no shortening when measured from the anterior superior spine, this resulting from release of the innominate bone from its attachment to the sacrum.

The limb is externally rotated, with toes everted.

Severe shock attends this condition. The injury to the viscera and blood-vessels is the chief cause of death, the bladder being wounded most often.

V. E. DUDMAN.

Couteaud: Prognosis of Gunshot Fractures of the Thigh (Du prognostic des fractures de cuisse par coup de feu). *Bull. Acad. de méd.*, Par., 1918, lxxxix, 352.

Experience in former wars created the opinion that the prognosis of gunshot thigh fractures was always very grave. This is no longer true. Of 250 thigh fractures treated in the Cherbourg Hospital during the war, 215 were open gunshot fractures. There have been 31 deaths. These 215 fractures, two-thirds of which were diaphyseal, occurred in 213 patients, two of whom had both limbs smashed. Of the 182 survivors, 38 are entirely cured; 92 resumed active service; 21 recovered with a more or less useful limb; and 31 have been mutilated.

Some of the deaths and deformities have been due to concomitant lesions. There have been 61 amputations, disarticulations, etc., and a large number of esquillectomies for osteomyelitis. Of the 31 deaths, 27 occurred during the first six months of the war.

Complete functional activity of the thigh has been re-established in only 20 per cent of the cases; recovery with slight shortening and sufficiency of play in the joint has been obtained in 50 per cent; there were mutilations in 17 per cent and a more or less defective limb in 11 per cent. There were 6 pseudarthroses, 4 shortenings greater, and 17 less than 10 cm. Several cases of exuberant callus have been noted.

Infection is the chief danger in thigh injuries, especially gaseous gangrene. Of 15 patients so attacked the author has been able to cure 6. When the section of the amputated bone is yellow, the prognosis is bad.

All forms of septicæmia are seen in thigh fractures. Phlebitis of the superficial veins of the limb is less to be feared than that of the deep vessels. It has caused numerous sudden deaths after only a slight effort.

Four patients died from hæmorrhage. Tetanus was a complication in 5 cases and caused 3 deaths. Even if there is recovery, coaptation of the fractured fragments cannot occur. Lesions of the sciatic nerve were observed 9 times. W. A. BRENNAN.

Hall-Edwards, J.: Fracture of Sesamoid Bones. *Arch. Radiol. & Electrotherap.*, 1918, xxii, 381.

The author's attention was directed to the probable existence of this lesion by his roentgen findings on the foot of a man who had suffered an injury some years ago and subsequently had much pain in the great toe-joint. The sesamoid over the metatarsophalangeal joint of the great toe showed distinct fragmentation. Although realizing the possibility of multiple sesamoid bone formation, he believes his case was one of fracture on account of the rough appearance of the opposing edges. The case is noteworthy on account of the scarcity of mention of the condition in the literature.

ADOLPH HARTUNG.

Rouvillois, H., and Guillaume-Louis: The Treatment of War Fractures (A propos du traitement des fractures par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 516.

The authors' experience indicates that while primary suture is the ideal in war fractures, it is not always realizable and has its contra-indications. The first contra-indication to primary suture after surgical cleansing is a long period of time elapsed after injury. In shell wounds the development of virulent infection renders suture dangerous. Although in some cases they have succeeded in suturing a wound sixteen hours old, yet they think generally that this should not be done after twelve hours.

The character of the wound may be a contra-indication. Very comminuted fractures, particularly when the muscular attrition is extensive, and especially in the thigh region where the thick muscle masses do not ensure a complete clearance of injured tissue, ought only to be primarily sutured with great care. The existence of a vascular lesion is an absolute contra-indication to primary suture.

Vascular gangrene is frequent and the dead muscle is a most excellent culture medium for microbes. Multiple wounds should be considered a contra-indication to primary suture.

When such contra-indications do not exist, the authors primarily suture after rigorous and complete surgical cleaning and lavage of the area with alcohol-ether. The progress of the wound is under constant bacteriological control. This is necessary to success, as the clinical signs do not suffice. In favorable cases the evolution is aseptic and the stitches can be drawn by the eleventh day. But even if partial removal of sutures be necessary owing to the development of a slight infection, the ultimate prognosis is greatly modified and the fracture is greatly benefited by the partial closure. There are cases, however, which in spite of the most vigorous sterilization develop infection. It is necessary to reopen, drain, and chemically sterilize. The authors employ Dakin's solution, Delbet's magnesium chloride, or a soap solution.

W. A. BRENNAN.

Ferguson, R. S.: Incomplete Outward Dislocation of the Knee. *J. Am. M. Ass.*, 1918, lxx, 1213.

Outward dislocation of the knee is a very uncommon injury. In the case reported, the injury was produced by a direct blow above the external condyle of the femur, while the patient was standing. Such a blow causes an oblique tear of the internal ligaments and joint capsules and rupture of the anterior crucial ligaments. The intact posterior crucial ligaments cause outward rotation of the leg. The limb is held rigidly extended. The internal condyle of femur is projecting. The patella rests on the lateral aspect of the external condyle. The external tuberosity of the tibia is displaced out and back. The internal tuberosity of the tibia is in line with the external condyle of the femur. The entire external articular ridge of the tibia can be palpated. There is extreme pain.

Reduction under anæsthetic is accomplished by complete flexion of the knee and hip, the left hand of the operator behind the tibia, with the thumb on the external margin of the patella; the right hand is at the ankle. The lower leg is now internally rotated, traction being made on the tibia and the leg extended. The patella is next slipped into place.

Extension is made for four days, followed by immobilization in plaster. Massage is given after the first week. A perfect result was obtained in six weeks.

LISTER TUHOLSKE.

SURGERY OF THE BONES, JOINTS, ETC.

Mayo-Robson, A. W.: Conservative Surgery of the Hand as Illustrated by a Case of Tendon Grafting. *Brit. M. J.*, 1918, i, 257.

In November the author was called to see a weaver, thirty-two years of age, with a view to amputating his right arm for an injury caused by machinery.

The whole of the inner side of the forearm up to the elbow was hopelessly crushed and lacerated, exposing the ulna from one end to the other, but not opening the elbow-joint. The muscles were torn and the bone rasped bare of periosteum. The wrist-joint was opened and the inner row of carpal bones was crushed. The three inner fingers were hopelessly smashed and the whole dorsum of the hand was swept clean of skin and tendons except the extensors of the thumb, which were bared but not otherwise damaged.

The index finger, excepting that its metacarpal joint was opened and that its extensor tendons had been completely torn away, was not further injured. The author decided to save the radius, the radial half of the carpus, and the thumb and index finger, and make an extensor indicis from the flexor tendon of the smashed middle finger.

The ulna was excised to within a short distance of the elbow, the inner side of the carpus was removed together with the three inner fingers, the skin of their palmar aspects being saved to lap over and cover the dorsum of the hand. The flexor tendon of the middle finger was taken out of its sheath and four and a half inches of it detached and placed over the site of the extensor indicis, the proximal end of the tendon being stitched to the fleshy belly of the extensor communis digitorum, the distal end being fixed to the small portion of tendon left near its insertion into the phalanx. The skin was brought over to cover as nearly as possible and no drainage was employed. The wound pursued an aseptic course and the patient returned home within a month and was advised to try to use his finger and thumb.

He returned to his work in February and was able to perform his work as a weaver as well as ever. The movements of the fingers were good, both in flexion and extension, the wrist-joint was movable, and both supination and pronation could be effected.

V. C. HUNT.

Babcock, W. W.: Interilio-Abdominal Amputation; a Description of a New Method, with Report of Three Cases. *Surg., Gynec. & Obst.*, 1918, xxvi, 554.

In a well illustrated article the author gives reasons for, advantages of, and a description of the technique of this operation. The following advantages are pointed out:

1. The practically absolute provisional hæmostasis without additional incision or apparatus.

2. The facility with which amputation may be carried out under local anæsthesia with a minimum of shock.

3. The removal of all the skin and deep tissues of the thigh, the flaps being formed above the level of Poupart's ligament and the gluteal fold.

4. The removal *en masse* of the amputated part, the lower abdominal wall, the inguinal and deeper pelvic lymphatics with the adjacent fascial planes and soft tissues.

5. The restoration of a strong abdominal floor and anterior abdominal wall.

6. The use of a single relatively small posterior or postero-external flap with ample blood supply.

7. If necessary, the removal of part or all of the innominate bone.

The technique of the operation does not lend itself well to a brief abstract, but is well worth the consideration of those interested.

C. C. CHATTERTON.

Mouchet, A., and Pamart: The End-Results of Arthrotomy of the Knee (Résultats éloignés des arthrotomies du genou). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 768.

The authors have been able to follow and observe the functional results in 54 cases of arthrotomy of the knee. Six gave excellent results; 15 were good, i.e., complete extension and flexion reaching 90 per cent; 14 fair results, flexion being less than a right angle and extension not equal to normal; 19 poor results. The statistics therefore show 30 per cent of good results; 25 per cent fair and 35 per cent incomplete results with more or less ankylosis. These patients were treated for a year at least.

The authors think the results on the whole satisfactory — and that they can be made more so if the operated cases are submitted to a less rigid and less prolonged immobilization; if they are assured of continuous necessary care in special hospitals; and if surgeons at the front reserve the large U-arthrotomy for such extensive injuries as require ample light in operating. W. A. BRENNAN.

Cofield, R. B.: Treatment of Septic Arthritis. *Ohio St. M. J.*, 1918, xiv, 149.

Suppurative arthritis may be the result of a penetrating wound into or near the articulation, or it may be the sequence of a focal or general infection originating in some distant part of the body. It is on this latter condition that Cofield bases his paper.

Frequently this form of arthritis is encountered developing during the course or following an attack of scarlet fever, pneumonia, gonorrhœa or typhoid fever. In the great majority of acute joint infections nothing is encountered more severe than a synovitis with or without effusion, which readily clears up with conservative treatment.

An acute suppurative arthritis may be secondary to a serous synovitis or it may start without any obvious serous stage. When it follows a serous effusion the symptoms gradually increase in severity, the swelling and pain become more marked, redness of the joint becomes evident, the temperature usually rises, and aspiration of the joint cavity discloses a cloudy or purulent fluid. It may be septic, ushered in with chills, high temperature, pain, swelling, and loss of motion eventually. The diagnosis can be made by the withdrawal of fluid from the joint with an aspirating syringe. X-ray is of little value in the early stage. Later when the cartilages have suffered in the destruction and bony changes have taken place, a roentgenogram may aid in the prognosis and influence the treatment.

In the great majority of cases synovial fluid is found to be sterile. The result of some experiments carried out by Wherry, of Cincinnati, has led the author to believe that the infection must be located within the synovia and para-articular structures and that the effusion is purely reactionary to the inflammation within these tissues.

Efficient treatment of septic arthritis depends, first, upon a thorough disinfection of the joint structures, and second, complete immobilization of the joint in a proper position. Cofield calls attention to the fact that he had unsatisfactory results in using the method advocated by Murphy, namely, the aspiration and injection of two per cent formalin in glycerin. He calls attention to the fact that Dyas in experimenting with rabbits found that both cultures and smears from septic joints previously treated with two per cent formalin solution still showed the presence of streptococci.

The author is of the opinion that Dyas' results prove conclusively that two per cent formalin in glycerin was not efficient as a joint disinfectant. In his practice he has not hesitated to do an arthrotomy wherever necessary, but warns that either aspiration or arthrotomy should be done under the strictest aseptic precautions. His method of treating these septic joints is to inject five per cent phenol solution followed by fifty per cent alcohol, and that by normal saline. In gonorrhœal joints a normal saline solution maintained at a sufficiently high temperature to kill the organisms, about 115° F., has proven efficient. In the more recent cases he has used 1:15,000 bichloride in normal salt solution, flushing for fifteen minutes and ending with a normal saline.

He believes that complete immobilization of the affected joint in a proper position is of equal importance in securing satisfactory results, and that gentle passive motion with baking and massage will often hasten recovery, but at first the utmost gentleness is necessary in order to minimize the risk of exciting a recrudescence. The absence of signs of inflammation does not assure the absence of pathogenic organisms and well meant efforts may set up an active condition within the joint if passive motion is begun too soon. Immobilization may be secured by means of well padded splints or plaster-of-Paris casts, but no undue tension should be put upon the capsule.

The fibrous adhesions that form may be broken down by force after all inflammatory signs have subsided, but a complete anæsthesia should be used for this. Sudden, jerking movements should be avoided. After the adhesions have been broken down, the joint should again be immobilized, but removed from its dressings daily for massage, and both active and passive movements persistently carried out. G. W. HOCHREIN.

Gaudiani, V.: Kineplastic Amputations. *Ann. Surg.*, Phila., 1918, lxvii, 414.

In 1896 Vanghetti by a series of ingenious experiments on animals tried to demonstrate that the muscles of an amputated member when properly covered by skin and protected from retraction can preserve their function of voluntary contraction. Although the opportunities in civil practice have not been very great for the development of this method, a sufficient number of kineplastic amputations in various forms have been performed to make it evident that transmission of voluntary movements to an artificial member is of distinct value in the replacement of the function of a lost limb.

This method should be applied whenever possible, especially in the amputation of the upper limb, and even though not possible at the time of operation, the possibility of a future kineplastic transformation of the stump should be borne in mind. Such secondary operations should be favored, and possibly performed, in institutions where at the same time the artificial member could be constructed and fitted. Of course this method is not available in old stumps in which the muscles have atrophied and lost their power of contraction.

The after-care of such amputations is all-important, as it should attempt to prevent secondary retraction. This has been done by keeping tension on the muscles by a silk suture passed outside of the wound and attached to the dressings or to an extension apparatus. Massage and exercise must be begun early. GATEWOOD.

ORTHOPEDICS IN GENERAL

Campbell, W. C.: Operative Measures in Infantile Paralysis. *Texas M. J.*, 1918, xxxiii, 396.

The early treatment as well as late operative measures of treatment of infantile paralysis are considered.

Orthopedic treatment should begin as soon as the diagnosis is made. Rest and protection are advocated until the nervous symptoms disappear. There should be no weight bearing on the paralyzed limbs for from three to six months.

Apparatus should be used, along with massage, electricity, and muscle training for at least two years from the date of onset. Operative measures are discussed under: (1) correction of deformity; (2) limitation of mobility; (3) restoration of function; (4) restoration of balance.

All these measures may be necessary in restoring even a simple case. The author illustrates his paper with photographs and many brief case histories are given. C. C. CHATTERTON.

Gottlieb, A.: Prevention and Treatment of Localized Muscular Contractures. *Calif. St. J. Med.*, 1918, xvi, 254.

The causes of muscular contractions and their prevention and treatment are all briefly considered.

The prevention of muscular contraction the author believes is best done by mobilization of neighboring joints to secure rest to the injured part.

He believes in the shortest possible time fixation that is necessary and advocates early massage and exercise.

Treatment of developed muscular contracture is divided into mechanical and operative. Most cases can be cured by mechanical measures alone. Before mechanical measures are used, he advocates that the part be exposed either to radiant or connective heat, to light or electrically generated heat.

Exercises are taught and given manually.

C. C. CHATTERTON.

Smith, E. H.: Arch Defects of the Human Foot. *Calif. St. J. Med.*, 1918, xvi, 256.

The author describes various defects of the arches and suggests treatment.

In small children often an absence of bones or delayed ossification of bones accounts for the so-called weak feet in childhood.

The common type of broken arch is really a weak foot, which if allowed to continue, will result in bony changes and a flat foot.

In the organic type, the foot is rigid and bony changes take place which are extremely difficult to cure. Traumatic flat-foot is not uncommon. Infection may cause flat-foot. Paralytic conditions of muscles cause a separate class of flat-foot deformity.

Many types of shoes, supposed to be curative, he believes are useless and harmful.

He discredits some of the bone operations now in vogue. He believes in over-correcting flat-feet with plaster-of-Paris dressings, and uses in his own practice felt and leather pads which he finds are more satisfactory than the arches now on the market.

C. C. CHATTERTON.

Mayer, L.: The Treatment of Flat-Feet. *Med. Rec.*, 1918, xciii, 811.

From experimental work during the past three years, the author has found a foot plate which seems to him to meet all physiological requirements for the correction of flat-feet.

The technique is simple. No plaster model is necessary. An impression of the feet is taken and a paper pattern cut from the model. The inner side reaches to a point just behind the bearing area of the first metatarsal bone; the outer side to a point just back of the head of the fifth metatarsal. The inner side is made convex with the most prominent part, the scaphoid. From this paper form a celluloid model is cut and boiled to permit shaping. Experience is necessary to mold the celluloid model to meet all the requirements of correction. The anterior end must conform to the transverse arch. It must be convex from side to side.

It is advisable, the author states, to allow the patient two to three days to try out the celluloid model before a leather-covered metal plate is made as a permanent brace. JOHN MITCHELL.

SURGERY OF THE SPINAL COLUMN AND CORD

Couteaud: Spinal Injuries of War (Des traumatismes rachiediens de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 728.

The author has treated 42 spinal war injuries. In 12 of these there was section of the cord and all of these were rapidly fatal. The general mortality was 47.6 per cent. The diagnosis of a projectile in the spinal column, although facilitated by the X-rays, needs a skilled clinician. About two-thirds of the cases show effusion of blood in the spinal cavity. But although this may be the case, spinal puncture may be negative.

If section of the cord is incurable, hemisection is not necessarily fatal. Many fractures cure by rest. When there is an intravertebral projectile, especially in the canal, it calls for prompt operation. An early laminectomy is best for the patient and easiest for the surgeon. Risks of infection and compression of the cord are least for the patient and the bone is more manageable. It is perhaps difficult to overcome hæmorrhage, and the copious use of adrenalin in the canal is indicated. After exposure of the cord the use of a general anæsthetic may be dispensed with and medullary discontinuous anæsthesia adopted without risk.

Short histories of several cases are given.

W. A. BRENNAN.

Hassin, G. B., and Carroll, E. P.: Sacral Tabes with the Clinical Picture of a Lesion of the Conus Medullaris; Report of a Case. *J. Am. M. Ass.*, 1918, lxx, 755.

In tabes dorsalis the pathological changes are usually confined to the posterior roots of the dorso-lumbar region. Yet there are cases which affect chiefly the cervical, lumbar, or sacral regions. As a rule the lesions are segment-like as evidenced for instance by the simultaneous occurrence in the majority of tabes cases of lost tendon reflexes, Argyll-Robertson pupil, cerebral nerve involvement, anæsthesia of the chest, etc. But cases are occasionally seen in which the lesion can be localized from the clinical picture.

In the case reported by the authors there was exclusive involvement of the conus medullaris producing a classical picture. The patient was a male of forty-two years, with a six-year history of urinary and fæcal incontinence and painless chronic ulcers on feet and buttocks. There was also girdle pains at the level of the hips and numbness from the umbilicus down. There was complete saddle-like anæsthesia of the perineum and adjacent parts. There were none of the other common symptoms of tabes. Blood and spinal fluid were Wassermann negative. There was no history of trauma.

Autopsy study, besides revealing typical syphilitic lesions elsewhere, showed a typical tabetic involvement of the sacral cord only, especially the last three segments. The case is the only one on record and suggests that some cases of so-called conus lesion may be nothing but tabes. C. A. HEDBLOM.

Hughes, D. M.: Laminectomy for Gunshot Wound; with a Record of Three Successful Cases. *Brit. M. J.*, 1918, i, 280.

A gunshot wound of the spine may produce a complete or incomplete lesion of the cord. A complete lesion is evidenced by flaccid paralysis with loss of reflexes and sphincter control, and denotes that a complete interruption of the impulses in the tracts of the cord has occurred. In incomplete injuries the missile hits the spinal column, but the theca is not hit by the missile or the displaced bone, and the resulting paraplegia may be: (1) quite transitory and flaccid but apparently complete; (2) may only appear after an interval; or (3) may or may not have a transitory period of flaccidity with completeness merging more or less rapidly into a spastic condition of any degree. These three conditions may be caused by: (1) concussion; (2) intraspinal, subdural or intramedullary effusion; (3) granulation tissue about a sinus or retained missile; or (4) callus.

The indications for operation as given by Makins from experiences in the South African campaign are: (1) excessive pain in the area above the paralized segment, for relief of immediate suffering, (2) a recovering lesion which seems due to fragments of bone or missile encroaching upon the spinal cord.

As to prognosis, there will not only be spontaneous recovery in concussion which produces a shock resulting in cessation of function of the whole cord, but a large number of spastic paraplegias also improve or recover with rest. The gravest sign is flaccid paralysis which entails complete loss of function of the sphincter, motor, and sensory tracts below the lesion. If transitory, the prognosis will be good; if persistent, it will be bad. The slow progress of caries paraplegia gives good opportunity for prolonged observation, and a definite involvement of the nerve tracts is seen; disturbance in motion occurs first, then very soon sensation; but a considerable degree of impaired sensation may exist with but slight loss of motion. Sensations however are usually lost before the sphincters are affected. In recovery sphincter activity returned first, then sensation, and lastly motion.

In five of the author's cases the missile was in the spinal canal and all were complete cases. In three the missile was removed with no improvement of the patient. In four there was flaccid paralysis and laminectomy was done for girdle pains or to remove foreign bodies; no improvement resulted and one died. Three had spastic paraplegia of different degrees and all made complete recovery and complete return of health. In each case a de-

gree of sepsis was present. Case 1 was postponed on account of sepsis of the emergent bullet wound until it was thought inadvisable to put off the decompression longer. This laminectomy wound made a primary healing. In Case 2 pus was encountered in the callus in the spinal canal and the wound drained for a few days. In Case 3 the operation was undertaken in the presence of a freely discharging sinus leading to the body of the vertebra and in this case a mild localized myelitis retarded the recovery.

In Case 1 the paralysis was slight at first and increased in severity. In Case 3 the paralysis was present at first and improved considerably before operation. In Case 2 paralysis came on suddenly nine weeks after the injury in a patient apparently well. In each one of these three cases the sphincters were not involved, damage was done to the spinal column but not to the cord itself, and recovery was complete. The dura was not opened in any case.

P. W. SWEET.

SURGERY OF THE NERVOUS SYSTEM

Delagenière, H.: Surgical Treatment of Nerve Wounds; Operative Technique and Results of 245 Cases of Suture and 113 Liberations (Traitement chirurgicale des blessures des nerfs; technique opératoire et résultats de 245 cas de suture et de 113 liberations). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 522.

The author's report is based on the results obtained by Tinel in his neurological clinic. At the time of injury the nerve may be either completely sutured with the two ends in the wound, the fibers in both ends being infiltrated with blood, or the injury may be such that though physiologically the function is suspended, section is not complete. When the wound is cicatrized and the nerve is exposed, there may be any of four types of lesions: (1) compression or simple strangulation; (2) burial in a fracture canal; (3) complete or incomplete interruption by a cicatricial fibroma; (4) complete interruption by section with or without loss of substance.

Every nerve wound, whether it is a perforation, notching, or section, with or without separation of its extremities is almost always a neuroma, or pseudo-neuroma. A neuroma is found on the central end; a pseudo-neuroma on the peripheral end. Both are obstacles to regeneration and must be resected and the freed axis-cylinders of both ends put in contact. In the case of sensory-motor nerves the fibers must be exactly approximated when sutured. The sensory fibers in both ends must meet in the sheaths to which they correspond, and similarily with the motor fibers.

The technique is easily deduced from these general considerations. At the time of injury if the nerve is found completely or almost completely sectioned, a freshening of the ends or a slight resection followed by suture must be immediately done. Such immediate sutures give excellent results and even if they should fail, a secondary resection can be done later when the wound is healed. In a late operation after cicatrization, after disclosing the nerve a careful dissection is made above and below the site of lesion and endeavor made to find the portions above and below which correspond, so as to avoid malposition of the axis-cylinders.

Minute dissection will show whether it is merely a question of compression. The neuroma of the central end and the pseudo-neuroma of the peripheric end are searched for and resected. The diseased parts of the nerves are sectioned by fine-cutting scissors starting from the center of the lesion and progressing toward the healthy part of the nerve. Approximation of the stumps is aided by flexion of the limb. This flexion in addition to traction on the nerve, according to the author's experience, can obviate 10 cm. of shortening in the sciatic, 6 cm. in the radial, 5 for the median, and 2 to 3 for other nerves.

Suture of the two ends is made by separate stitches of fine silk or linen with non-cutting needles. Four to six stitches suffice. Catgut should never be used. If the two ends cannot be approximated, recourse must be had to grafting. Musculocutaneous grafting has given the author 3 complete successes. For some time suture has been done in two stages. In a first operation as much as possible of the diseased nerve is resected but enough of the solid fibrous tissue is preserved to make a suture of these tissues. By this means a progressive elongation of the nerve is obtained. A later second resection is then made under very good conditions. The sutured nerve must be placed in tissue as normal as possible. Wrapping the nerve in pieces of artery sheath, rubber, metal, etc., are bad procedures as they isolate the nerve from living tissue and engender atrophy or resorption. The author has put the nerve in a piece of split neighboring muscle in an interstice of the aponeurosis. If the suture has been done in a flexed limb, the limb must be maintained flexed in a plaster cast from a month to six weeks.

In young patients in good general condition the author finds nerve regeneration to be effected at the rate of 1 to 1.5 mm. per day after suture.

In 245 cases of nerve suture and graft followed for more than two and a half years, there were 181 sutures done under good conditions with 120 excellent results, 41 fair results, and only 20 failures, or more than 80 per cent positive results and nearly 70 per cent excellent results. In 55 cases the suture was done under bad conditions, such as insufficient freshening of the stumps, imperfect coaptation of the fibers, or coaptation in a septic area. In these

55 cases there were 6 excellent, 18 fair results, and 31 failures.

Nerve suture, therefore, correctly made under good conditions is almost always followed by success. In this respect the author draws attention to the condition in the neurological clinic of Tinel in which the patients were under long careful post-operative supervision with the addition of every necessary after-treatment, massage, faradization, etc. This is an essential part of the successful results of nerve surgery.

In 9 cases with very large loss of substance the author used musculocutaneous grafts. There were 3 almost complete successes and 6 incomplete results. When approximation of the two separated ends is impossible, the author has never seen regeneration.

It is difficult to determine the duration of regeneration. In the radial nerve complete regeneration has been observed after four months when the suture was early and in good condition. In the same nerve under different conditions it has required thirteen months or more.

Liberation of a nerve, except after a simple compression, always gives a functional result inferior to that obtained after resection and suture. The opinion of Tinel regarding liberations is quoted: "It is very difficult to form an opinion of the value of nerve liberations. We have done relatively few because it has seemed to us that they do not generally give better results than abstention." Delagenière says that, emboldened by the almost constant success of nerve suture, it has been the practice for the past eighteen months in severe neuritis to section and suture the nerve. The procedure has given excellent results. W. A. BRENNAN.

Young, J. K.: Gunshot Wound of the Posterior Cord of the Brachial Plexus. *Boston M. & S. J.*, 1918, clxxviii, 501.

The author describes a case of gunshot wound resulting in paralysis of the right arm. A bullet had passed under the middle third of the clavicle, with its path of exit through the infraspinous area of the scapula, fracturing the fourth rib posteriorly about two inches from its attachment to the vertebræ.

Neurological analysis of the case resulted in a diagnosis of laceration or division of the posterior cord of the brachial plexus, and operation was performed to restore the continuity of the cord. Of the three routes, division of the clavicle, division of the pectoralis minor, or operation through the axilla, the second was chosen. This revealed the cord in this region surrounded by inflammatory products, but not divided. The patient subsequently had full restoration of function in parts supplied by this cord. V. E. DUDMAN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSES, ETC.

Ribas y Ribas, E.: The Treatment of Cancer (Tratamiento del cancer). *Rev. de cien. méd.*, Barcelona, 1918, xliv, 1, 41, 81.

Ribas y Ribas draws the following conclusions on the treatment of cancer:

As regards biologic and biochemic conditions:

1. That a precancerous state exists.

2. That metabolic products of the cells, altered in their relations with the surrounding media, are highly irritating and act upon the cells and connective tissues.

3. That the chemical products of the cells play an important part in the cellular development and multiplication and these phenomena, and may be provoked by the administration of chemical substances. Glucogenesis and the presence of lecithin are connected with the cellular hypernutrition and multiplication of cancer.

4. That the organs of internal secretion have an important influence on the malignant neoplasm.

5. That the blood of cancerous patients constantly shows modifications: acidosis, leucocytosis, antitryptic power increased; diminution of glycolytic ferments and hæmolytic power.

6. That general defences of the organism exist: phagocytosis; the hepatic function forming ferments destructive to the malignant cell; defensive ferments throughout the entire organism, freed by spontaneous as well as provoked autolysis.

7. That the neoplasm provides local defences; degenerations; hæmorrhage, hyalinosis; concomitant sclerosis.

As regards immunity:

1. It is seen experimentally that a natural or acquired immunity to cancer exists.

2. That such immunity may be modified by alimentation.

3. That injection of malignant neoplasm does not give a specific immunity.

4. That the resistance and immunity acquired are temporary and when long are accompanied by hypertrophy of the liver and spleen.

5. That individuals are observed in the clinic refractory to cancer in spite of exposure to the known predisposing causes.

6. That cancerous families exist commonly showing only arthritism, which is thought to be a favoring means of transmission of a suitable medium for development of cancer, although the heredity transmission of the neoplasm is denied by the majority of authors.

7. That there is an immense biological field open for biochemic and cellular study in order to explain the resistance to cancer and to find the means of modifying and increasing this resistance.

As regards prophylaxis:

1. There is a cancerous territory probably prepared by arthritism, diabetes, syphilis, chronic intoxication, excess of fat and albumin in food, etc.

2. This fully demonstrates the existence of precancerous conditions, of precancerous territories provoked by chronic irritations, traumatic or chemical, and chronic inflammations.

3. Therapeutic prophylaxis will have as its object (a) to modify the cellular metabolism; (b) to suppress all causes of chronic irritation; (c) to watch for and remove any precancerous lesion.

As regards curative treatment:

1. In the actual state of knowledge a surgical intervention should be made as soon as cancer is diagnosed, and preventive therapeutics should be practised.

2. Roentgeno- and radiotheraphy are in order and ought to be combined. There are very notable successful results from these agents in cancer of the uterus and skin cancers.

3. Chemotherapy ought to be combined with radio- and roentgenotherapy.

4. The beneficial modifications obtained by vaccines authorize their employment.

5. Organotherapy should be tried when there is a proved deficiency of the functioning of the liver or an internal gland. W. A. BRENNAN.

Masson, P.: Botryomycotic Gunshot Wound (Plaie de guerre botryomycosique). *Lyon chirurg.*, 1918, xv, 230.

Masson describes a case of botryomycosis in a gunshot wound, a thigh fracture, which confirms Magrou's researches on the etiology of this disease. Histological examination of the fistulous cicatrix of the wound showed œdematous granulation tissue with numerous capillaries lying in sclerous connective tissue. There were isolated or fused small nodules in both regions. The nodules included many mononuclear leucocytes and near the center an increasing number of polynuclear leucocytes.

The center was formed of a drop of pus imbedding two kinds of foreign body: (1) necrosed bone spicula; (2) strange little bodies containing a granulated substance and surrounded by a thin refracting membrane. The two types of foreign body, differing in appearance, have the same nature; the small sequestra include colonies of cocci which become free by necrosis and resorption of the protecting bone spicula. The microbe colony then covers itself with a thin refracting coat to protect itself from contact with pus. The colonies of gram-staining microbes recall the features of granules of actinomycosis or of botryomycosis of the horse.

Masson believes that the disease, erroneously called botryomycosis, is in reality a reaction of the organism against the staphylococcus. Magrou's experimental researches showed that the botryococcus was not a distinct species, but was identical with the staphylococcus doré. If this agent is injected in massive doses into the testicle of a guinea-pig it causes necrosis of the organ before there is time for effective leucocytic action; if injected in small doses the parasite is destroyed by the leucocytes; if injected in medium doses the action of parasites and leucocytes are equalized and the staphylococci collect in granules in the midst of the inflammatory area. They become adapted to the new conditions of life and form a protective covering.

The formation of granules, which was observed in Koch's bacillus, in actinomycosis and actinobacillosis indicates only the symbiotic adaptation of the cocci to the host. Masson calls attention to the practical point of his case; if the pus had been examined by the Carrel method the examination would have been negative in spite of the fact that the wound was filled with numerous microbes included in the granules. W. A. BRENNAN.

Bayliss, W. M.: Intravenous Injection in Wound Shock. *Brit. M. J.*, 1918, i, 553.

Wound shock is preferable to the names "surgical" and "traumatic" shock. Primary and secondary stages are differentiated. Primary shock occurs immediately on receipt of the wounds, and is in many ways similar to an exaggerated fainting. Secondary shock occurs after partial recovery. Low blood-pressure and its consequences are the most general and obvious signs of secondary shock. The immediate cause of low blood-pressure, apart from hæmorrhage, is still obscure. The following conditions can be excluded as causative factors; acapnia, adrenal exhaustion, exhaustion of nerve centers, inefficient action of the heart, paralysis of arterioles or veins, especially of the abdominal area.

The hypothesis of "exæmia" of Cannon (accumulation and stasis of blood in capillary areas, so that it is removed from currency as effectively as if lost to the exterior) finds the most favor.

The effects of insufficient blood supply owing to low blood-pressure are multiple, and it is a combination of several of these that gives the bad results and these are exaggerated by hæmorrhage. A high blood-pressure itself is not the principal object, but rather an increase of the blood and oxygen supply to the tissues. Consequently the use of vasoconstrictor drugs is to be deprecated. Blood transfusion does not appear to be of any more value than other solutions. A fall of one-third in blood-pressure means a fall in blood supply by two-thirds or more. Ringer's solution has been found to be useless, both experimentally and in actual practice. Hypertonic and isotonic saline do not give the best results. The addition of calcium is too transitory and is undesirable.

As to acidosis, the blood never becomes really acid but a part of its normal bicarbonate content becomes neutralized by combination with some fixed acid (lactic, etc.) produced in the tissues on account of defective oxygen supply. The results described as produced by acidosis are those due to a rise in the hydrygen-ion concentration. Ex-

perimentally, Bayliss has found that as much as one-third to one-half of the bicarbonate can be combined with fixed acid without the production of any increase in the hydrygen-ion concentration of the blood. Acidosis is not in itself a serious factor in shock, and alkaline injections are uncalled for. Solutions of salts in general are merely of temporary value, and likely to be followed by a greater fall in blood-pressure. Gelatin and gum arabic are the only two colloids serviceable. Gelatin is not practical because of the danger of containing tetanus spores, and it may cause intravascular clotting.

Gum arabic is used in 6 per cent solution and maintains the blood-pressure indefinitely in both wounded men and animals. It does not leave the blood-vessels and is innocuous even in a volume equal to one-half the total blood volume (1½ liters in man). It produces no hæmolysis nor agglutination in man and does not increase the viscosity of the blood. Commercial products contain small amounts of calcium and potassium salts, so all that is needed is the addition of 0.9 per cent of sodium chloride and tap water to make 6 per cent of gum arabic. This must be filtered through flannel or some other convenient medium and then sterilized. Its value is best shown after hæmorrhage, but will be of no avail when the bulbar centers have permanently lost their excitability. It should be given as early as possible.

Conditions in which gum arabic injections have been found of value are: severe hæmorrhage from abdominal wounds and from arteries; cases in which hæmorrhage and shock were not excessive, but in which a dangerous fall in blood-pressure followed operation; other cases in which there was severe shock, but only slight hæmorrhage. Some of these were complicated by gas gangrene, and one case of this infection in which there was neither shock nor hæmorrhage, but a blood-pressure of only 70 mm. Hg., recovered after the blood-pressure had been restored by gum.

The general conclusions drawn are that the main factor in the successful treatment of wound shock is to ensure an adequate supply of blood, that is, of oxygen, to vital organs, especially to the nerve centers. This is most simply done by intravenous injections of gum solution, which does not appear to be in most cases inferior to blood. When very great hæmorrhage has occurred, it would seem reasonable that blood transfusion should be done.

If the use of sodium bicarbonate is thought necessary, it is best given by stomach or rectum. But it has not yet been demonstrated that the symptoms relieved by bicarbonate would not be more effectively cured by raising the blood-pressure. In principle it would seem to be a mistake to reduce the slight increase of acidity of the blood, since this is of value in stimulating the respiratory center, and there is no evidence that the slight increase of hydrogen-ion concentration which is present in some cases of acidosis, but not always, is in any degree harmful in itself. CARL R. STEINKE.

Delaunay, H.: Intravenous Injection of Locke's Serum with Gum Arabic in the Treatment of Severe Hæmorrhagic Hypotension and Shock (Sérum de Locke gommé en injection intra-veineuse, dans le traitement de l'hypotension des hémorragies graves et du shock). *Lyon chirurg.*, 1918, xv, 211.

Low blood-pressure alone may cause death after a serious hæmorrhage, and massive infusions of saline solution, though raising the blood-pressure momentarily, are powerless to save the wounded. These patients have lost the greater part of their serum proteins wihch Delaunay thinks is the chief cause of fatal exhaustion. The ideal treatment of this kind of shock would be an infusion of fresh blood serum with all its proteins. But this method offers many difficulties and Delaunay has attempted to replace blood serum by Locke's solution with the addition of gum arabic. The results have been highly satisfactory. After a severe loss of blood the injection of gummous serum gives a remarkable reanimation which is in every way identical with the results with blood serum provided that the blood lost has been previously replaced by saline or glucose solution. The gum arabic acts like the proteins, raising and keeping up the blood-pressure.

The author has studied the physiological action of gum on the circulatory system. It seems to act by viscosity, increasing peripheral resistance, and by osmotic pressure. The clinical effects have been observed in animal experiments and in 3 cases of serious shock in human subjects. In posthæmorrhagic shock the results are excellent if the vasomotor nervous system is not exhausted and the lost blood is replaced as above; on the contrary, if the system is exhausted even when the loss of blood is insignificant, injections of gum and serum as well as direct transfusion are powerless.

The Locke and gum arabic solution is prepared as described below. Precautions must be taken in sterilizing by boiling because if the fluid is boiled with all its constituents there will be a precipitate of carbonate of calcium. The two following solutions are therefore prepared and separately sterilized by boiling, then mixed when required. The solutions may be prepared in ordinary and strong grades according to the quantities given:

FIRST SOLUTION

	Ordinary Solution	Strong Solution
Gum arabic	30 gr.	50 gr.
Chloride of sodium	8 gr	6.5 gr.
Chloride of potash	0.2 gr.	0.8 gr.
Bicarbonate of soda	0.2 gr.	0.5 gr.
Glucose	1 gr.	1.5 gr.
Water	990 gr.	990 gr.

SECOND SOLUTION

	Ordinary Solution	Strong Solution
Chloride of calcium	0.2 gr.	1 gr.
Water	10 gr.	10 gr.

The maximum injection of the Locke and gum solution should not exceed 150 ccm. W. A. BRENNAN.

Mottram, J. C., and Russ, S.: A Contribution to the Study of Dosage in Radium Therapy. *Arch. Radiol. & Electrotherap.*, 1918, xxii, 309.

The authors present a very complete study of the action of the radium rays on secondary carcinomatosis. The case was one of glandular carcinoma of the breast of the schirrous type in an unmarried woman, aged fifty-three, the breast lesion having been present for seven years. Four years following the appearance of the primary lesion there was a development of numerous nodules under the skin of the head and trunk. Following the appearance of the skin nodules, she was subjected to X-ray treatment with no benefit.

At the time of the beginning of the radium studies, the patient was wasted and pale. The left breast presented at the site of the nipple a small, puckered ulcer, covered with a dry crust. Numerous cutaneous nodules were present, varying in size from a half inch in diameter to minute nodules only palpable with difficulty. Several hard nodules were found on the scalp, giving rise to bald patches. There were no enlarged lymphatic glands, and no other evidences of secondary growths.

The changes in the skin resulting from exposure formed a progressive series and were described under the following headings:

Erythema varied from a faint pink to a deep dusky discoloration. It was often the only skin change following exposure to radium, and in no case have other skin changes been observed not preceded by erythema.

In a few cases a transient œdema was observed six hours after exposure, more especially when intense sources of gamma rays were employed.

Scaliness and pigmentation commonly succeeded the primary erythema. In many cases, however, these changes were masked by the more profound changes, such as exudation, following large doses of radium. Pigmentation often persisted for many months. In a few cases, the erythema was followed by the formation of a shallow blister, which either dried up or became a moist surface discharging serum. In a great number of cases, the irradiated area became covered with a heaped-up dry exudation or crust, resulting from the slow discharge of serum, which dried up as quickly as it was discharged. In other cases, the rate of discharge of serum did not permit of its drying locally, and thus a moist surface resulted. In a few cases in which the injury was more severe, the discharge of serum from the moist surface was blood-stained.

In all these, skin reactions were followed by healing, but in many cases, permanent alteration of the skin resulted; there was either partial or complete destruction of the hair.

If ulceration of the skin had occurred, accompanied by either a dry exudation or a moist surface, then after healing a permanent absence of pigmentation was frequently observed; this was associated with a thin, glossy, hairless skin, as is often seen in the scars following other skin injuries. A final permanent change in the irradiated skin consisted in the formation of dilated venules; this was always accompanied by leucoderma, and only followed the severe ulcerations.

The author has conveniently classified his studies under the following heads:

1. Comparison of the effects of beta rays, according as a large quantity is used for a short time, or a small quantity for a long time. The time taken for the reactions does not vary appreciably, whether the exposure be two or six hours, but the degree of such reaction corresponds with the length of exposure. There is much less effect upon the skin when it is exposed for a long time to a weak source than when a strong source is used for a short time.

2. Comparison of the effects of screened beta rays under various conditions of irradiation. The same reactions were obtained when no filter was used as when one millimeter of aluminum was used, adjustment having been made by varying the time of exposure. This finding is analogous to that reported in 1.

3. Comparison of the effects of gamma rays over a wide range of intensity of radiation. This study was made by covering the capsule with a millimeter of lead, as radium so covered emits mainly gamma rays. This necessitated increasing the exposure from two hours to about five and a half days in order that the top layer of the skin shall actually absorb the same amount of energy. Such an exposure is just as effective in causing the disappearance of the nodules as the shorter exposure to unscreened rays, but the reaction of the skin was much less. When the quantity of radiation is increased so that the exposure is a matter of hours, the effects upon the skin are not less but rather more pronounced when gamma rays are used than when unscreened radiation is employed, explained by the fact that when the surface equality of beta and gamma rays is established, the layer at a depth of five millimeters will be actually absorbing about nine times as much gamma ray energy as that of the beta plus the gamma type.

4. Comparison of the effect of unscreened beta and gamma rays upon the skin and subcutaneous nodules, over a wide range of intensity of radiation. The general trend of the results is to confirm those which figure in 1, 2, and 3. The times taken for the different phases of the same reaction to appear do not vary very much with the dose administered, but the degree of such reaction does. When a small quantity of radiation is administered for a long time, there is far less disturbance of the skin than when a large quantity is applied for a short time.

In the explanation of these findings, the authors suggest that they are bound up with a series of changes which form the cycle of the cell's life, that is, growth to maturity, division, and growth once more. It has been shown by several observers that the stage of cell life represented by division is an especially vulnerable one to radiation. Mottram has shown that the ova of ascaris megalocephala are

about ten times as vulnerable when in the dividing stage as in the growing stage. From studying the progress of a rapidly growing sarcoma of a rat, it was concluded that even in this rapidly growing tumor, it would be necessary to give the exposure over four days, in order that all of the cells should receive irradiation during the phase of division.

W. A. EVANS.

SERA, VACCINES, AND FERMENTS

Van Saun, A. I.: The Wassermann Reaction with Diabetic Sera. *J. Med. Research*, 1917, xxxvii, 205.

In the course of a number of routine Wassermann examinations it was possible for the author to note the result of the Wassermann reaction on sera obtained from diabetics. As many workers have contended that diabetic sera gave non-specific reactions with Wassermann antigens; that sera from diabetic patients with no syphilitic history frequently gave false positives, it seemed to the author that perhaps the record of her experience with such sera tested in the course of the performance of the Wassermann reaction on over ten thousand specimens received during the year 1916 might be of interest to those engaged in serological work. In her work all sera were tested in duplicate and with two antigens.

Seventy-three sera were received from patients with a known history of diabetes. Almost all of these sera were chylous, and many of them extremely so. This appearance she states is frequently observed in sera from diabetics, since in this disease the fat content of the serum is usually abnormal.

Only one serum gave a positive reaction, fifty-one were negative, two doubtful, and with nineteen the serum controls failed to hæmolyze, so that no readings could be made. All the sera giving the so-called anti-complementary results were chylous.

The one serum which gave a positive result was obtained from a patient who had also a history of syphilis.

The sera with which doubtful reactions were obtained gave only weak fixation. One of these sera was obtained from a patient who gave a history of a chancre twenty-six years previously. The other patient gave no history of syphilis.

These results with sera from cases of undoubted diabetes seemed to the author to dispose of the contention that diabetic sera give readable positive reactions with Wassermann antigens when there is no clinical evidence of syphilis, and that with carefully controlled tests non-specific fixations can always be checked. The nineteen sera giving non-specific reactions in this series of tests might easily have been supposed to be positive, had not their anti-complementary qualities been fully demonstrated by the double as well as the single serum controls.

GEORGE E. BEILBY.

BLOOD

Loeb, L.: The Organization of Blood-Clots After Auto-, Homo-, and Heterotransplantation. *J. Med. Research*, 1918, xxxvii, 353.

Former investigations have shown the differences in the behavior of connective tissue and lymphocytes of the host toward various tissues, as well as the differences in the fate of the introduced tissues after auto- and homotransplantation. In these cases tissues that had an active metabolism of their own were dealt with. The author thought it of interest to compare with these tissues the behavior of blood-clots after auto- and homotransplantation. While it may be assumed that in red blood-cells after transplantation oxydative processes may still proceed for a certain time, it is improbable that in erythrocytes continuous specific metabolic activities take place under those conditions. It seemed to him of interest to determine whether blood-clots also would elicit a specifically different reaction after auto- and homotransplantation. He furthermore added to these studies experiments in which blood-clots of the rabbit were introduced into the guinea-pig, which corresponded to heterotransplantation. Possibly the greater strangeness of the blood of a foreign species was able to produce reactions similar to those of actively metabolizing tissues after homotransplantation. he states.

Guinea-pigs were used in his investigations, which were primarily undertaken with a view of studying comparatively the reaction of the host tissue towards identical and strange cells, although they are also of interest as a contribution to the study of the process of the organization of blood-clots.

The author distinguished two kinds of organization of the blood-clot: (a) the provisional, and (b) the definite one. The provisional organization consisted in the ingrowth of more or less isolated fibroblasts into the coagulum. This ingrowth took place as long as there was left some remnant of unorganized coagulum. In the dense coagulum a certain number of fibroblasts perished. The remnants of nuclei seen in the coagulum and the large number of fibroblasts seen at early stages as compared to some later pieces suggested such a conclusion. The author considers it very probable that what appeared as a simple clot was a mixture of clot and "fibroplasm." Some of the fibroblasts became transformed into fibers in the clot. How many of the fibers of the clot were fibrin and how many were transformed fibroblasts was difficult to determine. Constantly new fibroblasts grew into the coagulum, using the fibers of the coagulum in their wandering, their way paved by the dead bodies of the fibroblasts which preceded them.

Different pieces were organized with varying rapidity. These variations were in part dependent upon variations in the size of the original blood-clot. In addition, it was probable that the organization proceeded with different rapidity in different

animals. The remnants of the blood-clot gradually became smaller in all cases. Seventeen, eighteen and twenty days after the introduction of the clots the amount of coagulum still unorganized had diminished considerably, and the number of pieces in which no clot was seen had increased. At last he found merely fibrous tissue in which were embedded cells containing blood pigment. These pigmented cells were the last vestiges of the blood-clot.

In most pieces he found inside the connective tissue capsule, and surrounding the clot proper, blood which seemed to have been shed more recently, probably from the capillaries which were newly formed in the surrounding fibrous tissue. He considered it possible that these hæmorrhages occurred at the time when the clots were removed from the animal.

Mitoses occurred in both the fibroblasts in the capsule around the clot as well as in the fibroblasts entering the clot. They occurred also in epithelioid cells which were formed in the clot.

The fibroblasts not only moved into the clot and organized it, but through their kinetic power they tore off superficial parts of striated muscle on which the clot rested and pushed these pieces further up toward the clot. At the same time they sometimes succeeded in bending and turning the muscle and splitting it into smaller particles. Thus these muscle particles were found far removed from their original position, and they were gradually transformed into fibrinoid material, hard to distinguish in appearance from true fibrin. It may be assumed, the author states, that the muscle thus attacked was already injured from the beginning.

Throughout the process of organization, cells which migrated into the clot now and then took up erythrocytes and transformed them into pigment. These cells lay between the fibers and assumed often a round form. They also sometimes seemed to destroy fibrin in the clot, and to act as "fibrinoclasts" in a manner comparable to the action which osteoclasts exert toward bone.

At certain places in the clot he observed at various periods of the process of organization epithelioid and giant cells. In the epithelioid cells he found blood pigment and also the giant cells took up pigmented cells lying in their neighborhood. These epithelioid and giant cells formed at places where the clot was especially dense and offered resistance to the progress of the cells, probably fibroblasts. At such places he very often found the clot changed, the pigment appearing in brown, yellow, or greenish colors.

Lymphocytes were nowhere very prominent in the guinea-pig clot. He often found very small collections of lymphocytes in the fibroblastic-fibrillar or hyaline tissue which surrounded the clot. They were found especially around blood-vessels and sometimes around the nerves in the neighboring tissue. Here they probably filled lymph-vessels accompanying the nerve; they were also found among the fibroblastic tissue invading the clot. They were absent in both auto and homo pieces sometimes, and were sometimes present in both. When present, they were always found in small numbers.

The author feels justified in concluding that in contradistinction to kidney and thyroid, in which homotransplantation called forth different reactions in the host, the homo character of the blood-clot did not elicit a specific response on the part of the host. In case a response was called forth, it was quantitatively so slight that it was not comparable to the effect of thyroid and kidney tissue. He therefore concludes that this homo response was produced through the vital specific metabolic activity of tissues and not through the splitting of the tissues, or through such oxydative processes as perhaps occurred in the erythrocytes of blood-clots. The homo toxins were produced through the vital metabolic activity of tissues and not through their disintegration.

Heterotransplantation of blood-clots (transplantation of rabbit clots into guinea-pigs) differed in the following features from auto- or homotransplantations: (a) The amount of fibroblastic tissue surrounding and organizing the coagulum seemed to be more extensive. Capillaries penetrated into the clot at an early period. (b) The clot itself underwent changes which indicated certain processes of solution; especially were cavities frequently found in the clot. (c) The infiltration of the organizing fibroblastic tissue with lymphocytes was more pronounced than in the case of auto- and homotransplantation of blood-clots. However, in different pieces the number of lymphocytes present varied. (d) The number of polynuclear leucocytes present in the clots and in the surrounding fibroblastic tissue was greater than in the case of auto- and homotransplantation of clots.

GEORGE E. BEILBY.

McCann, F.: Suggestions for the Prevention of Postoperative Thrombosis and Embolism. *Brit. M. J.*, 1918, i, 277.

Sepsis is the most important causative factor, but intravascular clotting apart from sepsis does occur. Transfixion of blood-vessels in mass ligation McCann believes is a more or less unrecognized and preventable predisposing cause. A ligature so introduced, that is infected or that becomes so, may arrest the natural process of clotting and the clot may liquefy and become detached in whole or in part. Transfixing ligatures should, therefore, never be used. Blood-vessels in the broad ligament and omentum, for example, should be picked up and tied separately. Similarly care should be exercised in making incisions in such a way as to as far as possible avoid large vessels. In all operative work sutures should not be tied so tightly as to cut into the blood-vessel and accurate hæmostasis should be achieved, leaving no blood-clots as potential foci for infection.

C. A. HEDBLOM.

BLOOD AND LYMPH VESSELS

Gatellier: Some Considerations upon Vascular Wounds with Reference to a Case of Arterial Intubation (Quelques considérations sur les plaies des vaisseaux à propos d'un cas d'intubation artérielle). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 437.

In a series of 123 ligatures of various vessels there were 20 recoveries in cases which on being received did not show any state of hæmorrhagic shock. In the 103 other cases there was some hæmorrhagic shock, and of these after ligation 96 recovered and 7 died. Eight secondary amputations were necessary. The secondary amputations were distributed thus: In 5 axillary ligatures there were 3 secondary amputations; 2 iliac ligatures gave one amputation; 18 femoral ligatures gave 3 amputations; 11 posterior tibial ligatures gave 2 amputations. Thus although ligature saves the life it does not always preserve the limb. Gatellier therefore sought some method better than ligature.

He found the opportunity in a case with a high popliteal wound with ischæmia of the limb, rapid gangrene threatening. There was a large loss of substance in the arterial wall which was torn over half its circumference. Attempts to suture were impossible. The wound was washed with warm serum, clamped above, and the region surgically cleansed. The artery was washed out with serum and a paraffinated silver tube introduced by the breach, the artery being sutured over the extremities with catgut, and the clamp removed. Pulsation was at once felt in the vessel below the tube. Five hours after operation the limb which previously showed all the signs of threatened gangrene was warm and rosy. The next day the toes recovered their sensation. Seventy-two hours after operation when collateral circulation was well established, the tube and arterial segment were removed. There was not the least sign of necrosis nor any signs of clotting.

With the exception of this one case of intubation, all other vascular injuries were ligated in healthy non-contused tissue.

Gatellier does not find good results from ligation at a distance. In his 123 ligatures he had secondary hæmorrhage occur only once. W. A. Brennan.

ROENTGENOLOGY

Armstrong, R. B.: The Part X-Ray Plays in the Treatment of Cancer. *J.-Lancet*, 1918, xxxviii, 190.

When diagnosed early and before metastasis has taken place, and when in an accessible region, thorough removal of cancer by surgical means is primarily indicated. Often a patient will return after a time with the adjoining parts breaking down or with a metastasis.

Of late years much has been done to help to attain a good recovery by the use of the X-ray and radium. By new and improved technique and apparatus it has become possible to give the roentgen ray in much more massive doses and hundreds of times the former radiation. Every particle of matter penetrated by the X-rays absorbs X-rays of varying quality and quantity, becomes radio-active and gives off minute rays itself, secondary rays.

The X-ray acts upon the molecular, atomic, or subatomic structure of the tissues. The results may be recognized clinically as stimulation, irritation or loss of tissue. The characteristic and unique action of the X-ray is the production of cell degeneration; the action is local and reaches every cell in the irradiated area. The selective action of the X-ray is the basis of roentgen therapy. Diseased cells or tissues are more sensitive to the X-ray than normal tissues, and abnormal cells are especially susceptible to irradiation. Pathologic tissues composed of young, rapidly growing cells of low vitality do not offer great resistance to the X-ray. Sarcomata are very sensitive to irradiation. Post-operative irradiation gives the patient the best chance for ultimate recovery when given as soon as possible after operation and repeated two or three times during the year following.

One must guard against toxæmia or acidosis, and it is best to give alkalies in large doses before or after massive radiation. The treatments must not come too close together. Care must be observed in the filtration of the secondary rays, and not less than three millimeters of aluminum and one-fourth of an inch of sole leather used. Frequent urinalyses, blood-pressure readings and blood examinations should be made, and during the treatments the room should be carefully ventilated.

Where operation is not advisable, X-ray may prolong life, give comparative comfort and may even arrest the advancement of the disease. In deep cancers perhaps the cross-fire method is the most effective. By the perfected technique the number of burns has been reduced. The patient must be protected with coverings impervious to the ray and the dosage carefully regulated.

The Coolidge tube permits the passage of enormous quantities of current for long periods of time, resulting in the emission of great quantities of roentgen rays. V. C. Hunt.

Case, J. T.: A Brief Summary of the Indications for Roentgenotherapy. *J. Mich. St. M. Soc.*, 1918, xvii, 133.

The author gives his technique and methods of treatment in various lesions which have shown themselves amenable to X-ray therapy.

In general all chronic skin lesions which have resisted other means of treatment are benefited by X-ray therapy. It was formerly the custom to use soft tubes but now the author prefers to use hard rays even for many skin lesions because in some cases the disease extends into the deeper layers of the skin, to reach which the harder X-rays are needed.

The X-ray is indicated in few, if any, acute skin lesions, unless it be a stubborn case of weeping

eczema. Even in chronic lesions X-ray therapy should not be employed unless the case has shown itself resistant to ordinary means. It is very important to inquire of the patient whether previous X-ray applications have been made, to bear in mind the possibility of the case being luetic, and to make certain explanations regarding some of the dangers of X-ray therapy in order to be forewarned in case of an untoward reaction.

It is now recognized as a general rule in all roentgenotherapy, with the exception of malignant cases, that a definite reddening of the skin should be studiously avoided. If a reaction of the first degree or worse does occur following treatment, it invites the later development of telangiectases, although they may not make their appearance for from one to three years, perhaps even longer; in the majority of cases they do not occur at all. It is important not to use any other irritant drugs or measures which will inflame the skin and thus encourage an X-ray burn.

The author then gives the indications for and against X-ray therapy in ring worm, eczema, psoriasis, lichen, prurigo, leucoplakia, acne vulgaris, acne rosacea, lupus vulgaris, lupus erythematosus, warts, Paget's disease, mycosis fungoides, blastomycosis, port wine marks, nævus pigmentosus et pylosus, paronychia, keloid, luetic lesions, ulcers, hyperidrosis, superfluous hair, enlarged glands, epithelioma, sarcoma, carcinoma, prostatic hypertrophy, uterine fibroids, exopthalmic goiter hyperthyroidism, anæmia, Hodgkins' disease, leukæmia, and thoracic disease. C. B. HOLLINGS.

Fullerton, A.: The Use of the Opaque Ureteral Catheter to Localize Missiles in the Region of the Kidney and Ureter. *Arch. Radiol. & Electrotherap.*, 1918, xxii, 371.

On account of the variable position of the kidney and differences in the thickness of the overlying tissues, it may be impossible to state definitely whether a missile in the kidney region is actually in that organ or merely near it, even though an accurate localization in different planes may have been made. The determination of this fact may have an important bearing on the treatment.

To ascertain it, the author has been using the opaque ureteral catheter *in situ* combined with stereoscopic roentgenography with excellent results. He cites a case in which he was able definitely to locate a bullet relative to the kidney and ureter before operation and confirmed his findings at the operation. A second case with three shell fragments in the renal region was similarly examined and the findings proven accurate by postmortem examination. ADOLPH HARTUNG.

Shearer, J. S.: Localization of Foreign Bodies; the Standard Methods Approved by the Surgeon General's Office, U. S. Army. *Am. J. Roentgenol.*, 1918, v, 229.

The methods selected have aimed to meet the following requirements: (1) The apparatus required should be simple. (2) The manipulation should not require an undue amount of skill. (3) The time required should be a minimum consistent with reasonable accuracy. (4) All operations likely to lead to error must be excluded. (5) The comfort of the patient should be considered.

In order to bring errors to a minimum incident to the reading of fine scales or any scale in bad light, to making arithmetical computations, drawing diagrams, or changing from bright light to read scales and back to fluoroscopic work, such accessory devices and organization of steps have been adopted as would tend to eliminate those contributing sources of error. To avoid confusions which might be caused by the varying descriptions in the literature, the methods adopted are referred to by letter rather than by the names of those responsible for their development. The object has been to obtain information of practical value in the removal of foreign bodies rather than refined mathematical accuracy.

The methods are divided into two groups. In the first, comprising methods A, B, and C, a mark is made upon the skin and the distance of the projectile from this mark is determined. In the second group, including methods D, E, and F, some material guide is given the surgeon to assist him during operation. The latter require more time as a rule and are bettter adapted for use in the base hospitals. It is assumed that the majority of the work will be done with the standard X-ray table by fluoroscopic methods and with the tube below the table.

Method A is the two-wire, double-tube shift method. The accessory devices needed with this are: (1) a substantial brass frame carrying two wires firmly attached across two opposite corners, protected by a thin sheet of aluminum, moving with the tube box; (2) a small celluloid scale with two sliders; and (3) a special scale giving the depth of the foreign body in centimeters and fractions thereof. The shadow of the projectile is first brought to the center of the fluoroscopic screen and perpendicularly below it and the skin marked at that point. The tube is then shifted until the shadow of one of the wires in the brass frame coincides with the displaced shadow of the projectile, and one of the sliders marks this position. Shifting the tube in the opposite direction until the other wire coincides with the shadow of the projectile determines the location of the second slider. The distance between the sliding markers is then utilized to determine the distance of the foreign body below the skin mark, the special scale giving the required depth.

Method B utilizes the optical principle of parallax. It consists essentially in adjusting an outside opaque body at such a depth alongside of the part containing the projectile that its shadow moves the same distance with a definite tube shift as does the shadow of the projectile with the same tube shift. A piece of celluloid ruled with parallel lines facilitates

the ascertaining of equality of motion. A special frame provided permits of the marking of the skin at the entrance and emergence of the vertical ray passing through the foreign body and also along a continuation of the rod carrying the special indicator. By using this with attached scales, the distance from the skin in three directions may be ascertained.

Method C makes use of arithmetic computations with the aid of the single tube shift and triangulation. The skin is first marked at the point of emergence of the vertical ray, this point coinciding with the center of the fluoroscopic screen. The tube is then shifted a known distance and the amount of displacement of the projectile shadow noted. With the aid of the known distances the depth may be ascertained by numerical computations. The process may be facilitated by working with constant factors or by use of an exact set-up device available.

Method D resorts to the drawing of diagrams by means of which the anatomic relations of the part in which the projectile is imbedded can be shown. A piece of hinged flexible metal is adjusted around the part and three lines of sight, each passing through the projectile, are indicated at their points of entrance and emergence by marks upon the skin and metal. The latter is then removed and a tracing made with it in its original position. By joining the points of the sight lines, the intersection shows the location of the projectile, and with the aid of a cross section anatomy definite anatomical information may be obtained as to the relative location of the surrounding structures.

Method E makes use of the Hirtz compass and accessory devices. To quote the author: "The essential feature of the Hirtz compass is the possibility of adjustment of the movable legs that support the instrument, so that when resing on fixed marks on the body of the patient the foreign body will be at the center of a sphere, a meridian arc of which is carried by the compass. This arc is capable of adjustment in any position about a central axis. An indicating rod passes through a slider attached to the movable arc in such a way as to coincide in all positions with a radius of the sphere, and whether it actually reaches the center or not, it is always directed toward that point. If its movement to the center of the sphere is obstructed by the body of the patient, the amount it lacks of reaching the center will be the depth of the projectile in the direction indicated by the pointer.

"The value of the compass lies in its wide possibility as a surgical guide, in that it does not confine the attention of the surgeon to a single point marked on the skin, with a possible uncertainty as to the direction in which he should proceed in order to reach the projectile, but gives him a wide latitude of approach and explicit information as to depth in a direction of his own selection." The method is rather complicated and requires detailed study of apparatus, technique and accompanying diagrams.

Method F utilizes a cannula and trochar to approach the foreign body through the skin and tissue under fluoroscopic guidance. It is considered the least desirable of the methods adopted.

Regarding the assistance fluoroscopy may offer during operations, four methods have been proposed:

1. The X-ray work may be done in the surgical operating room, thus requiring the surgeon to operate in special light which may be extinguished when he desires to examine fluoroscopically.

2. The patient may be returned to the X-ray room when the surgeon requires further information.

3. The roentgenologist may be called to the operating room for temporary assistance in pointing out the position of the projectile.

4. The operation may be performed with special forceps while using the fluoroscopic light as a guide.

Each of these has its difficulties as well as merits, some of which are described by the author. Appended to this article is a table showing the depth of anatomical landmarks beneath the skin, taken from an article by Metcalf and Keys-Wells in the *Lancet* of May 27, 1916, and attention called to its value for the surgeon when operating for the removal of foreign bodies. ADOLPH HARTUNG.

MILITARY SURGERY

NOTE. — Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

Charles, R.: Gunshot Wounds of the Abdomen at a Casualty Clearing Station. *Brit. M. J.*, 1918, i, 337.

Diagnosis of intraperitoneal injury is often difficult. The signs and symptoms associated with these cases are not constant. The following points are important:

The entrance and exit wounds give an idea of the path of the missile. The absence of an exit wound does not necessarily mean that the missile is lodged in the viscera. The facial expression is usually that of anxiety. Pain may or may not be present and may be referred. Tenderness elicited by deep pressure over the injured viscera is of great importance. Rigidity is an unreliable symptom. The pulse increases directly with the gravity of the lesion. Vomiting is usually present. X-ray is the most useful guide to diagnosis.

Treatment varies with the general condition of the patient, irrespective of the type of wound. Moribund patients are relieved as far as possible of pain and thirst. Those in various degrees of collapse

but capable of resuscitation are treated for shock. This consists in heat and saline subcutaneously with brandy, or in grave cases intravenous saline with 3 per cent bicarbonate. Operation should not be undertaken until the patient has recovered from shock. These cases as a rule have ceased to bleed and dangerous sepsis from perforation of the bowel does not occur for six hours. The patient must be kept warm, and saline is given during the operation. Speed is the first essential in avoiding further shock. The prognosis varies immensely with the length of operation.

A paramedian or transverse incision is made. Bleeding is first attended to. A systematic search is then made for the injury. Wounds of the intestine are covered with gauze, perforations clamped and left outside. The rest of the intestine as far as possible is returned at once into the peritoneal cavity. When both large and small bowels are perforated, the large one is usually sutured first. End-to-end anastomosis is the most rapid.

Wounds of the liver are often treated conservatively. Sometimes laparotomy is necessary and packing of the wound to control hæmorrhage after excision of the track, if accessible, or mechanical cleansing. In twenty-four to forty-eight hours, when the peritoneal cavity is walled off, gauze is removed and the Carrel-Dakin treatment instituted. Missiles in the pancreas were removed in two cases and drainage secured through the transverse mesocolon previously sutured to the anterior abdominal wall. The kidney is exposed by a transverse incision. Where possible, excision of only infected or damaged tissue with suture and drainage is recommended. Nephrectomy is done only for complete destruction of torn vessels.

The question of drainage is decided on the relative infectivity of the parts injured, and on the time elapsed since the wound was inflicted. Wounds of the small intestine operated upon within twelve hours may be closed with safety. Wounds of the large bowel are drained when possible.

Abdominothoracic wounds fall into four groups with respect to treatment:

1. Separate entrance wounds in the chest and abdomen. If the chest wound is not a blowing one, the abdomen is dealt with first; then if the patient's condition permits, the chest wound is attended to.

2. Entrance wound on the left about the sixth or eighth rib, with a high abdominal lesion. If the missile has gone through, conservative treatment is often sufficient. Where X-ray shows the missile in the lower abdomen, the case is treated as in the first group. Where the injury is limited to the upper abdomen, a transdiaphragmatic route is used because it saves time, access to the upper abdomen is easier, and a combined laparotomy and thoracotomy is avoided. The chest wound with all infected tissue is completely excised and enlarged backward and forward with the excision of five inches of affected rib. The pleura is opened, swabbed dry, and walled off with gauze. The rent in the diaphragm is enlarged to four or five inches. The abdominal condition is now treated, the diaphragm sutured, and injuries to the lung examined and treated as necessary. If impossible to close the parietal pleura and a large gap is left, it is closed by suturing the lung to the edge of the wound.

3. A wound of entrance on the left below the level of the eighth rib. In these cases the pleura often escapes injury. If present, it may be dealt with essentially as in the second group.

4. Wounds of the right side. The missile after penetrating the diaphragm is usually lodged in the liver. If operation is indicated, the pleural cavity is opened and probe forceps are passed along the tract to locate and remove the missile. If the pleura is pierced near the attachment, the edges of the wound in the diaphragm are sutured to the parietal pleura, effecting complete closure of the pleura and drainage of the liver.

Of postoperative complications, shock is the most serious and is treated as already outlined. A 2 per cent solution of gum acacia may be substituted for sodium bicarbonate. Transfusion of blood is practiced where loss of blood has been severe. Dilatation of the stomach is treated by lavage. Paralytic ileus may be nervous in origin or due to peritonitis. The symptoms are the same. Little benefit has come from ileostomy. Several recovered, treated by frequent gastric lavage, intramuscular pituitrin, saline and enemas. Gas gangrene is often fatal. It is treated by wide excision of the affected muscle.

A few case histories are given. Of 150 cases, 23 of which were abdominothoracic, there were 74 deaths. C. A. Hedblom.

Bowlby, A.: Primary Suture of Wounds at the Front in France. *Brit. M. J.*, 1918, i, 333.

Soon after the beginning of the war surgeons were divided into two classes, those who counseled the use of strong antiseptics, and those who believed that no antiseptic treatment could possibly so antagonize the innumerable bacteria as to permit of early closure of the wounds. The first proved to be the counsel of false hopes; the second remained the counsel of despair as far as primary closure of wounds was concerned. It became evident that these wound conditions presented new problems which would have to be solved by careful and laborious investigations.

It soon became apparent that too much attention had been directed to the bacteria and disinfection and too little consideration had been given to the grossly contaminated devitalized or dead tissues. It was learned that not only the missile and foreign material carried in with it but also all damaged tissue required excision. Without such excision antiseptics were useless; with it antiseptics are merely accessories.

Systematic primary suture began with the knee-joint after it was discovered that many perforating wounds did well even though the synovial fluid

was infected, provided only that the joint was not opened and drained. Very cautiously primary suture was applied to fractures of the skull and wounds of the brain and abdomen.

In 1916 and 1917, when operations were attempted on the lung, it was found that success depended on immediate closure of the pleural cavity after the operation. Primary closure of wounds in the limbs where large vessels and nerves make thorough excision of devitalized tissue difficult was finally made possible with improvement in technique.

The rapid shift in the fundamental conception of the treatment of wounds is well indicated by the expressions of the Surgical Conference of the Allies. In May, 1917, it was agreed that operation may be followed in some instances by primary closure of the wound, notably in case of wounded joints, but in November of that year the conclusion arrived at was: "Since our last session, the disinfection of wounds has passed from the domain of the chemist to that of the surgeon. Primary suture has taken the place of secondary suture and has become the method of choice." These conclusions were based on the results of primary suture in all kinds of severe wounds in both French and British hospitals in the intervening six months. In one series of 433 cases, 98 per cent were severe shell or bomb injuries. In 67 per cent healing was by first intention and in a great many of the others they healed with only a little surface suppuration.

In another group of 626 cases, 68 per cent healed *per primam*. Of 100 fracture cases, 75 per cent healed *per primam* and 15 per cent of the remainder after slight suppuration. Of a total of 1,202 cases under various surgeons, successful primary suture was done in about 70 per cent.

In these series of cases no antiseptic had been used. The bacteriological studies in connection with treatment by various antiseptics has also demonstrated that healing by suture takes place in the majority of cases in the presence of bacteria. The hæmolytic streptococcus infection seems to be the isolated exception to the rule. The wound must, however, be free from dead tissue and foreign bodies. Generally speaking, the earlier the patient is operated upon, the better. Duval reports that 80 per cent of the "lightly wounded" without fracture have healed *per primam* when sutured eight to twelve hours after injury. When much oozing occurs at the time the wound is cleaned up, suture should be delayed twenty-four to forty-eight hours. In case of doubt as to whether or not a wound should be sutured, it is better to leave it open until the indication for treatment is clear. If the wound edges are indurated and inflamed or if gas gangrene has already definitely commenced, the wound must be left open.

Judgment in the selection of cases and skill and thoroughness in technique together with strict asepsis are essential to successful treatment. More surgeons are needed for this work.

C. A. Hedblom.

Brewer, I. W.: The Physical Condition of American Men of Military Age. *N. Y. M. J.*, 1918, cvii, 216.

Among 1,000 cases examined for the regular army, venereal disease was the greatest cause for rejection, heart disease standing second on the list. Defects of hearing and vision were third and fourth, flat feet fifth, defective teeth twelfth, tuberculosis fifteenth, and mental weakness sixteenth.

H. H. Freilich.

GYNECOLOGY

UTERUS

Heineberg, A.: Bloodless Repair of the Cervix Uteri. *Am. J. Obst.*, N. Y., 1918, lxxvii, 652.

The technique of bloodless repair here described represents the results of several months' experimentation with various types of clamps, pins, and tourniquets. The author claims for it simplicity, ease of application, and efficiency. Hæmostasis is secured by the use of two angulated tenaculum forceps and a rubber ring such as is at times employed to secure the tops of umbrella ribs. The chief feature of the forceps, in addition to the angulation, is a pedunculated ball attached to the outer aspect of each blade just above the angle. These balls serve the purpose of retaining the rubber ring in a position to compress the cervix above the grasp of the forceps.

The technique is as follows:

1. Introduce a self-retaining speculum in the vagina.
2. Grasp the anterior lip of the cervix in the median line with an ordinary double tenaculum.
3. Dilate the cervix moderately, chiefly to determine the precise location and direction of the canal.
4. Draw the cervix toward one side and apply the angulated forceps to the cervix well above the level of the proposed amputation or denudation.
5. Draw the cervix to the other side and apply the second angulated forceps opposite the first one.
6. Remove the ordinary tenaculum.
7. Place the handles of the forceps together. Stretch the rubber ring over them and push it up on the cervix to above the retaining balls.
8. Separate the handles of the forceps and hand them to the assistant

The forceps thus held act also as lateral retractors of the vagina. In order to prevent a ragged tear in the cervix, undue tension upon the forceps or unnecessary separation of the handles must be avoided. If it is desired to remove the forceps and ring before tying sutures, the ring may be cut. When the vagina is long and narrow or the cervix cannot be easily drawn down, a forceps with a long curve instead of an angle is more easily applied.

CAREY CULBERTSON.

Bégouin, P.: A Method of Abdominal Hysterectomy for Fibroma with Lower Pole Impacted; Excavation Method (Procédé d'hysterectomie abdominale pour fibromes à pôle inférieur enclavé; "procede de l'evidement"). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 295.

Bégouin claims that the classical methods of abdominal hysterectomy for fibroma are not suitable to those cases in which the inferior pole is so impacted and fixed in the lower pelvis that it cannot be raised up, and remains unapproachable on all sides. He recommends an operation which he terms the method of excavation.

With the left hand the surgeon seizes the superior pole of the fibroma and pulls it up with forceps; and after having clamped the uterine and utero-ovarian vessels on each side, makes a circular peripheric incision at the level of the lowest part of the fibroma which should be easily accessible. Starting from this circumference the bistoury describes successive wide and deep cones, the final apex of which is below the center of the pelvic fibromatous mass, just as one would dig out the tainted part of a pear with a knife. This section being completed, all the upper abdominal part of the fibroma is detached and removed, leaving only a fibromatous cupola in the lower pelvis. The whole of the central part of the primarily unapproachable pelvic mass is thus emptied, and a pull with forceps on the edges of the cupola will easily effect its separation from the surrounding organs.

The preliminary part of the process does not cause any important hæmorrhage if care be exerted to keep the knife within the fibromatous mass, well within its capsule. But in any case vessels which might bleed are quickly exposed and can be clamped. No injury can occur to the neighboring organs if the point of the knife in cutting the cone is kept directly toward the center of the pelvic mass.

Bégouin has used this procedure seven times since February last. He thinks that in the special case of fibroma with impacted lower pole it is superior to all other methods, such as enucleation, section, etc. It has undoubtedly been used by many other surgeons who were forced to adopt it by the exigencies of cases rendered too difficult for the usual methods; but so far as he knows it is not regularly described in the texts, and he thinks it of practical interest to direct attention to it.

The discussion showed that this or analogous methods had been often used by others in the conditions described by Bégouin. Both Pozzi and Quénu preferred enucleation.

W. A. BRENNAN.

Wobus, R. E.: The Acetone Treatment of Uterine Cancer. *J. Missouri St. M. Ass.*, 1918, xv, 116.

Wobus briefly reviews the various treatments for uterine carcinoma and strongly endorses the acetone treatment, described by Gellhorn in 1907. It is valuable in inoperable cases, giving the patient comfort and a feeling of well-being.

The detail of technique is very important. A preliminary curettage should be done with a Boldt's cancer spoon in order to scoop out all the cancer masses. The rather profuse bleeding subsides

gradually as the normal firm tissue is reached and is effectively checked by the acetone.

The first treatment is given immediately after the excochleation. The patient is placed in the Trendelenburg position, a tubular glass speculum is introduced, and the cavity entirely filled with acetone. This should be repeated at least once, as the blood present dilutes the acetone. The fluid is removed with cotton swabs, the cavity loosely packed with gauze, which becomes saturated with the acetone, and the excess taken care of. This may be left in place until the following morning. A cotton tampon well saturated with vaseline is introduced and the speculum removed. Acetone does not irritate the vaginal mucosa, but affects the vulva, perineum, and anus when it comes in contact with them, and great care should be taken in protecting these tissues.

Subsequent treatments may be given at the office or the patient's home, commenced a few days after curettage and repeated every third to fifth day for as long as necessary. The patient's hips are elevated and the tubular speculum, coated with a thick ring of vaseline near the center, is used. The perineum is protected with cotton saturated with water. The acetone is poured through the speculum, which must be manipulated so that the fluid enters the crater and should be left for fifteen or twenty mnutes. The rest of the treatment is the same as after the curettage. A cotton swab at the end of a uterine dressing forceps may aid in bringing obscure cavities into the axis of the speculum.

Two illustrations, one of materials used and the other a schematic drawing of a cavity filled with air and preventing the liquid from entering, accompany the article. L. R. GOLDSMITH.

McDonald, A.: Abdominal Uterine Hæmorrhage in Young Women. *Arch. Diagnosis*, 1918, x, 361.

The cases as presented to the physician fall into one of two rather distinct groups: (1) those representing sudden deviation from a previously regular menstrual habit, possibly associated with amenorrhœa, and suggesting pathology of early pregnancy; (2) conditions of longer standing, menorrhagia or metrorrhagia, either of which may be important (a) as a symptom of serious lesion, new-growth, or (b) as a cause of constitutional changes, anæmia, etc.

Significant evidence to be noted includes: a period of amenorrhœa of from five to eight weeks, followed by atypical menstruation, sudden profuse flow with clots, irregular bleeding varying from scanty bloody discharge to profuse hæmorrhage, prolonged flow, unusual pain, especially unilateral, or the same conditions with no amenorrhœa. Such deviation, when sufficiently pronounced to bring the patient to her physician, is evidence of general or local pathological change and must be explained. Constitutional causes must be considered in some cases, but can usually be excluded by the history or examination.

Pathological activity of certain remote glands of internal secretion has a more or less direct influence on menstruation, but the resulting deviations are usually of longer duration. Menorrhagia is also observed in some forms of toxic exophthalmic goiter. A few cases of adrenal tumors or hypertrophy result in menorrhagia due either to internal secretion or pelvic hyperæmia. Pituitary lesions are most often associated with sexual dystrophy and amenorrhœa.

Sudden abnormal bleeding in young women following an amenorrhœa, however brief, is due to disturbance of early pregnancy till proven to the contrary.

In the absence of pregnancy, there are several lesions which give a clinical picture easily confused with ectopic gestation and characterized most prominently by atypical bleeding, unilateral pelvic pain and tenderness. These are: (1) mild exacerbation of chronic tubal infection or prolapse and torsion of a hydrosalpinx which causes pelvic pain and atypical bleeding, but no amenorrhœa; (2) ovarian cysts; (3) appendiceal inflammation, usually of the subacute type with adhesions to pelvic structures, which may cause atypical uterine bleeding without amenorrhœa; (4) small masses in the broad ligament.

Metrorrhagia is always of pathological significance, whether consisting simply of irregular bloody discharge or copious intermittent bleeding, especially when occurring at or near the menopause. The causes include: (1) abnormal uterine contents; (2) lesions associated with congestion or ulceration or endometrium.

Curettage, which is so often advised for these cases, should be done for diagnosis only, together with microscopic examination of curettings. Examination of curettings must be done by an expert since the microscopic picture of different stages of the menstrual cycle may be confusing, and a thorough curettage may miss a small area of cancer in the fundus. In certain cases where the diagnosis is still in doubt, exploratory hysterotomy is justified.

The importance of copious menstrual bleeding is measured not by the amount of blood lost, but by the effects on the patient.

It is easy to understand that normal functional activity of the uterus may be impaired by a number of conditions with no gross lesions of that organ. Such loss of physiological tone may be due to: (1) subinvolution, especially when resulting from rapidly repeated pregnancies; (2) chronic passive congestion with malposition; (3) inflammatory changes with infiltration of the myometrium; (4) premature or excessive senile fibrous degeneration and arteriosclerosis, especially when associated with increased ovarian stimulus.

Therapeutic measures include: (1) gland extracts and general treatment; (2) roentgen ray and radium; (3) exploratory laparotomy and hysterectomy.

EDWARD L. CORNELL.

ADNEXAL AND PERIUTERINE CONDITIONS

Grad, H.: Statistical Study of 100 Cases of Pyosalpinx. *Am. J. Obst.*, N. Y., 1918, lxxvii, 630.

Only the surgical aspect of the cases are here considered, no attempt being made to group them according to clinical classification. In the acute cases it has become the custom of the author to employ non-surgical measures only, unless it be the evacuation vaginally of abscess formation. In the subacute and recurrent purulent types various operative procedures were undertaken.

In 62 of the 100 cases, both tubes were ablated; in 15, but one tube; in 18 the uterus, both tubes, and ovaries were removed. In 43 cases, one ovary was removed at the time of the operation for pyosalpinx, and both ovaries in 18 cases. The appendix was removed in 28 cases. In 8 per cent, one or more plastic operations were also performed, such as trachelorrhaphy and perineorrhaphy. Three times the round ligaments were shortened and twice a myomectomy was necessary. In only 5 per cent of the cases was vaginal section done when pyosalpingitis was diagnosed. In 26 per cent the uterus was curetted at the same time.

In 50 cases no drainage was deemed necessary. In 43 cases the pelvis was drained by the vagina, in 6 cases by the abdomen, and in 1 case by both routes. Of the 43 cases drained from below, the abdominal wound broke down in 6 cases, or 14 per cent. In the 6 cases of drainage above, the wound healed firmly in every case. Death occurred in one case thirty-six hours after operation from profound sepsis.

The majority of the cases remained in the hospital from twenty to thirty days, 12 cases for less than thirty-five days, 0 for less than forty days, 5 for less than fifty days, one for one hundred and three days. One case left in ten days.

CAREY CULBERTSON.

MISCELLANEOUS

Phillips, J.: The Therapeutic Influence of X-Rays on Female Pelvic Disease. *Arch. Radiol. & Electrotherap.*, 1918, xxii, 333.

The treatment of female pelvic disease is the result of early experimentation in 1903, when the effect of the X-ray on testicles of rabbits was noted. A few years later its effect on the generative organs of the human female was definitely proved. Since that time abundant evidence has been collected to prove that X-rays are a most powerful remedial agent. Primarily the treatment was extensively tried in bleeding myomata of the uterus with very successful results, and from that time until now, its field of usefulness has extended to other diseases. The author quotes Bruce and Knox with reference to their methods. Bruce gives in a case of myoma the maximum of X-ray radiation, depending on two factors, the skin and the X-ray tube. In the case of the skin the reaction must be kept at lowest terms. His remarks in reference to the X-ray tube seem to indicate that the Coolidge tube was not used, otherwise the dosage could be mathematically accurate.

Knox informs the author that the anterior abdominal wall from the level of the umbilicus to the margin of the pubic arch is divided into a number of "ports of entry" by means of a skin pencil, generally from four to eight on the anterior wall. Four areas are marked on the posterior surface of the pelvis to include the whole of the sacrum. The first series of doses is given just after the cessation of a period if possible. About ten areas are given either in one day or two consecutive days; the latter method is preferable. A second series is given as soon as possible after the next period. A cessation of menstruation marks the commencement of gradual improvement. To produce a satisfactory result, from three to six months are required. The longer method is preferable as it disturbs the patient least. The author reports the therapeutic value to be due to the action on the ovaries, the ovary being destroyed. In addition there is some influence on the muscular wall of the uterus itself.

He recommends the following classes of cases for X-ray treatment: (1) fibroids of the uterus, whether producing hæmorrhage or pain, or the subject of rapid growth; (2) myofibrosis or metritis; (3) carcinoma of the cervix, and as routine treatment before, during, and after complete extirpation of the uterus; (4) colitis; (5) for sterilization after cæsarean section in place of exsection of the tubes; also in severe dysmenorrhœa and osteomalacia; (6) constitutional hæmorrhagic diseases; (7) to promote absorption in old standing chronic thickening; (8) certain skin diseases of the vulva, namely, pruritus, leucoplacia.

The author has noted the surgical end-results of his cases for thirty years and feels that some less drastic treatment might have been more successful, such as the intelligent use of the X-ray.

A discussion of the X-ray treatment in the type of cases enumerated above is given. The author concludes: "My own personal feeling is that in X-rays we have a very powerful remedy which, with increasing accuracy of diagnosis and administration, promises to be of inestimable value in the pathological female economy." C. B. HOLLINGS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Acharya, S. R.: Abdominal Pregnancy. *Madras M. J.*, 1918, i, 34.

A woman, aged thirty-eight years, was admitted to the Government Maternity Hospital. She complained of having a bloody vaginal discharge for two months and of an abdominal tumor which she noticed had been growing gradually for a year. She had had seven children, of which only two survived. She gave a history of an abortion eighteen months prior to the date of admission. Six months later she had amenorrhœa for ten months, then her present complaint began.

On opening the abdomen, a sac adherent to the anterior abdominal wall presented; on incising this a dark brown fluid escaped and a mummified fœtus was found inside. On removal of the fœtus and its placenta, another sac was seen adherent to the posterior aspect of the first sac. It contained a similar fœtus and placenta, which were removed. The uterus was not enlarged.

The wound healed by first intention and the patient was discharged from the hospital three weeks later.

EDWARD L. CORNELL.

Polak, J. O.: Diagnosis of Unruptured Ectopic Pregnancy. *Long Island M. J.*, 1918, xii, 121.

Polak states that a positive diagnosis of unruptured ectopic pregnancy or tubal abortion should be made in the vast majority of cases. In his service at the Long Island College Hospital, and in over 250 personal cases, a positive diagnosis was made in over 85 per cent of the cases. This he believes was attributable to the fact that a very careful history was taken and a thorough physical examination made in each instance. The conditions, pathological or mechanical, that may cause a delay in the progress of the impregnated ovum are always indicated in the history if the attending physician or surgeon takes the trouble to correlate the facts as stated by the patient.

Naturally the diagnosis of ruptured ectopic with the consequent hæmorrhage and shock is very much easier to diagnosticate.

The causes of ectopic gestation are fully discussed, particularly from the standpoint of the pathology of the various conditions that have to do with extra-uterine pregnancy. These in turn are linked with the past history, so that, by the proper interpretation of the pathology present, by the history that is always obtainable, the diagnosis at once becomes easier and more exact.

There are several very excellent drawings by Shannon that serve well to help elucidate the pathology of extra-uterine pregnancy.

The treatment, Polak believes, of the unruptured ectopic is operative as soon as the diagnosis has been made. After rupture has taken place, i.e., in the tragic stage, operation should be postponed until the patient has recovered from the shock incident to the hæmorrhage following rupture. Almost all of these patients will "come back" with rest and morphine. They are given an initial dose of half a grain of morphine, followed by one-fourth of a grain every three hours until the respirations are reduced to from eight to twelve per minute. The author further states that he has yet to see a case which has not reacted and become a safe operable risk under this treatment.

The operation is always done by the abdominal route and the tube either emptied of its contents or amputated. In the removal of the tube great care should be exercised in individually ligating the vessels in the mesosalpinx so that the collateral circulation to the ovary is not interfered with. "After the tube is removed, the ovary is suspended by suture of the infundibulopelvic ligament to the round ligament and the raw surface at the top of the broad ligament peritonealized by whipping the mesosalpinx and round ligament together."

HARVEY B. MATTHEWS.

Gardner, W. S.: The Cause of Tubal Pregnancy. *W. Virg. M. J.*, 1918, xii, 370.

Twenty pregnant tubes that had sufficiently long undilated portions remaining between the pregnancy and the uterus to make a block have been examined microscopically. In eight instances sections from the opposite tube also were made.

All but one of the tubes showed results of a past infection. The one in which there was no such evidence was associated with a large uterine fibroid and the pregnant tube was found crowded down in the pelvis under the tumor. In all of the others were found the same changes as are found subsequent to salpingitis.

The sections of all the tubes showed the same enlargement of all the cells making up the walls and the round cell infiltration that is present in the uterine wall during pregnancy. The only difference was that the reaction of the normal cells and the round cell infiltration was apparently greater in the wall of the pregnant tube than in the wall of the pregnant uterus. In one or two sections the round cell infiltration was so intense as to indicate the presence of an active inflammatory process.

Among the eight tubes examined from patients in whom a pregnancy was present in the opposite tube, one was found that was normal, showing only the cell changes that result from pregnancy. This tube was from a patient having a fibroid. Two

tubes were much distended; one was filled with blood and one with pus. Four showed many adhesions between the folds of the mucosa splitting the lumen of the tube up into numerous channels of various sizes. Four showed great increase in the connective tissue in the remaining folds. Two had the blood-vessels of the wall markedly dilated and filled with blood. All of them showed round cell infiltration in the walls of the tube.

EDWARD L. CORNELL.

Edgar, J. C.: The Treatment of Eclampsia. *J. Am. M. Ass.*, 1918, lxx, 1205.

For years it has been realized that thousands of pregnant women are practically unobserved until at or near their date of confinement. A long step forward in the prevention of eclampsia is the attention that in the past few years has been directed to the importance of prenatal care of women.

One outcome of this agitation is the recent organization of the Maternity Service Association of the City of New York. One aim, among others, of the nurses of a maternity center is to seek out among the women of the tenements those showing signs of pregnancy toxæmia and refer such women to the proper clinic or hospital of the sanitary zone in which they reside.

During January, 1918, twenty patients suffering from various prenatal and postpartum conditions were referred by the nurses of the maternity center to the Manhattan Maternity. Nine of these women received into the hospital were instances of pregnancy toxæmia. Five were primiparæ, four multiparæ. The blood-pressure ranged from normal to 228 mm. All had albumin in the urine, four had casts, and one had blood. Gastric disturbances were present in all, and œdema in most. Eleven convulsions occurred in one woman, and two in another after admission; seven had labor induced by Champetier de Ribes bags; the two convulsive cases went into labor spontaneously. In only one instance were forceps used. In one twin case version and breech extraction were demanded. In a fœtus dead from prolapse of the cord, perforation and extraction were performed. All the nine mothers are alive today.

Of the ten children, there being a twin case, one was lost from prolapse of the cord, one was stillborn at term, probably from toxæmia, and one, a three-pound macerated fœtus, was delivered. This patient had experienced seven previous stillbirths. She had a negative Wassermann reaction.

The time-honored principles of the curative treatment of toxæmic convulsions, namely, (1) control of the convulsions; (2) elimination of the toxins; and (3) termination of the pregnancy, still hold good, although recent clinical experience has somewhat modified them.

A one-time advocate of active surgical and medical treatment and bitterly opposed to morphine in eclampsia, experience of the past five years has radically changed the author's views and teaching. Like many another obstetrician, he frankly confesses to have been won over to the use of morphine. He stands for a reasonably conservative treatment, neither an ultraradical, with its incisions of the cervix, accouchement forcé, difficult forceps or version, vaginal or abdominal cæsarean operations on the one hand, nor an ultraconservative treatment with its main reliance on morphine and eliminations, on the other. So long as eclampsia is a mystery, a disease of theories, no one treatment is applicable to all cases.

Difficult forceps operation, forcible dilatation of the cervix, incisions of the cervix, and vaginal cæsarean section have no place in the modern treatment of eclampsia at term. A single low forceps operation is always in order. Ether is the only anæsthetic to be used for any operation.

The same may be said of hydrostatic bags to induce or shorten the labor, as well as the manual dilatation of a soft, already partially dilated cervix, to permit of a medium or low forceps operation. In the presence of a disease with such a high fœtal mortality from any treatment, perforation of the head and a careful extraction of the body should be justified to shorten the interval between the first convulsion and delivery in certain instances.

Until more is known of the causative factors in eclampsia, abdominal cæsarean section will always demand a place in the treatment. The indications for the operation are still limited by reason of the remarkable results that have been obtained from the morphine treatment.

Abdominal cæsarean section must be considered in a primipara with a long, undilated cervix, to anticipate the twenty hours of spontaneous labor that she would otherwise pass through. A twenty-minute abdominal cæsarean section, in the present knowledge of eclampsia, would appear preferable to the shock of a difficult version and extraction in a shoulder presentation, or the shock of a prolonged labor in moderately obstructed labor, whether of pelvic or of fœtal origin.

A review of the present and prospective obstetric situation causes a recurrence of the reflection that the very poor and the well-to-do are today receiving the best obstetric care, while those of the so-called middle class are the ones who, all too often, suffer from indifferent prenatal attention.

EDWARD L. CORNELL.

Manueco: Comparison Between Pubiotomy and the Cæsarean Operation in Moderate Pelvic Strictures (Juicio comparativo acerca de la pubiotomia y cesarea en las estreches moderadas de la pelvis). *Arch. de ginec., obst. y pediat.*, Barcelona, 1918, xxxi, 39.

Since January 1, 1910, among 805 labors, the author has observed 26 cases of contracted pelvis. These have been from 8 to 9.5 cm. No patient has been seen with a true conjugate diameter less than 8 cm. Of these 26 cases, 14 had a spontaneous birth; 12 had operative intervention. The interventions

and results were as follows: pubiotomy, 2 cases; prophylactic version, 2 cases; version for trunk presentation, 1 case; forceps in cavity, 7 cases.

The author considers a moderately contracted pelvis one comprised in the first and second grades of Baisch's classification, viz., from 7 to 8 cm. and from 8 to 10 cm. of true conjugate diameter.

The cæsarean operation obtained great popularity after the introduction of Franke's suprapubic method.

A comparison between pubiotomy and the cæsarean operation cannot be made *a priori*. One operation does not exclude the other and each has its own indications. It is to a great extent a matter of one's point of view, according as greater importance is attached to the danger for the mother or for the child. The chief objections to pubiotomy made by its opponents are: (1) that while its mortality is less than that of the cæsarean, yet this is obtained at the expense of danger to the mother; long convalescence, vaginal and uterine prolapse, hernia at the site of the osseous section and urinary incontinence. Manueco shows that these objections are more apparent than real.

As regards the cæsarean operation, it is the safest way to obtain a living child but the prognosis is more dangerous for the mother than in pubiotomy. The low mortality obtained by Schauta and others is exceptional and this may be reported as about 7 per cent. Subsequent uterine rupture, adhesions, the greater difficulties of technique, and the danger of infection render the operation more dangerous than pubiotomy. Even the most acceptable technique, the Latzko-Doederlein, is not extraperitoneal and the danger of infection is greater. The claim that this method is the most applicable in infected cases does not seem sustained to the author, judging from the unfavorable reports in this class of cases by Bumm, Doederlein, and others.

The author thinks that pubiotomy ought to be the method of choice in cases of moderately contracted pelvis; and that only exceptionally in cases of an extremely contracted pelvis and a large fœtus should the cæsarean operation be carried out. W. A. BRENNAN.

Morse, A. H.: Premature Separation of the Normally Implanted Placenta. *Surg., Gynec. & Obst.*, 1918, xxvi, 133.

Among the causes of antepartum hæmorrhage at full term, or nearly so, premature separation of the placenta occupies a place scarcely second in importance to placenta prævia, for it is no less frequent than placenta prævia and may require equally radical treatment. Occasionally, after the uterus has been emptied of the fœtus and placenta, the mother collapses and dies in shock without further loss of blood.

In these cases the uterus presents a remarkable picture; its color is bluish black from the extravasation of blood into its substance, and it resembles somewhat an ovarian cyst with twisted pedicle. Following delivery the uterus does not retract, but remains flaccid, and hysterectomy is necessary to control hæmorrhage. This abnormal reaction, as histological study demonstrates, depends upon the disorganization of the myometrium which is infiltrated with blood and lymph.

Two cases of this type were recently treated by abdominal cæsarean section and supravaginal hysterectomy. As there was no clinical evidence to indicate the cause of the intramuscular lesion, a series of experiments was performed and a technique developed which reproduced in animals the lesions which have been described in women suffering from the more serious type of premature separation of the placenta.

The clinical and pathological notes upon the two patients are given in detail. EDWARD L. CORNELL.

Berri, I. C.: An Interesting Breus Mole (Sobra una interesante mola de Breus). *Semana méd.*, Buenos Aires, 1918, xxv, 103.

The author relates a case of uterine mole in a woman aged 40 years, with a history of nine previous pregnancies, six ending normally at term and three aborted. The woman gave a four plus Wassermann reaction. In the present illness there was amenorrhœa for six months and metrorrhagia since the fourth month of pregnancy, which had now reached the seventh month. The woman aborted on coming to the hospital; the discharged ovum corresponded in size and aspect to that of a three months' pregnancy.

Detailed examination failed to discover a fœtus or any vestiges of one; it had perished in the early months and was resorbed. The piece had all the characteristics corresponding to the tuberous hæmatoma described by Breus. The placenta was retained a long time in the uterine cavity and showed structural alterations due to autolytic processes.

The author reviews the findings of Breus, Gottschalk, Taussig and others regarding moles and the mode of death of the embryo with subsequent evolution.

The author thinks that there is some specific connection between syphilis and the development in his own case. W. A. BRENNAN.

Smith, F. H.: Urinary Infections of Pregnancy and the Puerperium. *Am. J. M. Sc.*, 1918, clv, 392.

The diagnosis of these infections of pregnancy depends in large measure upon whether they are considered as among the possibilities of the illness. The main symptom in the greatest number is the toxæmia. Toxæmia, with high fever, chills, leucocytosis and pus in an acid urine, with the presence of the colon bacillus in pure culture, should of course suggest the diagnosis. When pain is the prominent symptom, the confusion that arises will depend upon how exactly it imitates some other pain. For instance, pleurisy may be suggested. The inflamed kidney moves painfully with breathing,

suggesting at once a respiratory disease. Pressure on the inflamed right ureter will often produce pain in the ileocæcal region similar to that of appendicitis. It is peculiarly liable to be confused with appendicitis in those cases in which there is no change in the urine for the time being, or if the urinary changes are slight and transient, or if the ureter is blocked so that only urine from the sound kidney is obtained by the catheter. Pyelitis may induce symptoms suggesting peritonitis. Pyelitis may also simulate salpingitis or puerperal infection.

Practically, however, the greatest difficulty in the differential diagnosis is to distinguish these cases from acute appendicitis. Chills, septic oscillations in the temperature, and pain are more violent in a renal case than in an early appendicular one.

Direct local treatment of the suppurative focus in the pelvis of the kidney and surrounding tissues through the cystoscope and ureteral catheter is the method of choice. There is one rather mechanical mode of treatment that is probably not so often used as it deserves, namely, the distention of the bladder to its physiological capacity, the patient reclining with only the head above the plane of the bed. This reduces congestion in the renal pelvis, stimulates kidney secretion, modifies the urine, and thus combats the cause of retention and helps in the evacuation of the kidneys.

The author's experience is that urotropin has rarely been of service in the upper urinary infections, perhaps because of the impracticability of getting the urine acid enough to split off formaldehyde during the rapid transit through the kidneys and ureters. When the infecting agent is the colon bacillus, the one method of treatment which has given most satisfaction is alkalinization of the urine by potassium citrate. The plan is to give potassium citrate in sufficient dosage and with sufficient frequency to render the urine alkaline and to keep it so, day and night, for at least a week or ten days after all symptoms have disappeared.

Treatment which has been efficacious and at the same time practicable is: (1) Rapid alkalinization of the urine with potassium citrate. This has been more certain by far than hexamethylenamin. Certainly, potassium citrate and hexamethylenamin should not be given at the same time, for one tends to render the urine alkaline and the other depends upon a high degree of acidity for any possible value. (2) In the meantime one can usually get a supply of the "sensitized" vaccine of the colon bacillus, because it can be sooner given than (3) an autogenous vaccine, which should be prepared as soon as possible. Under such treatment all cases should be controlled until delivery, but should the symptoms persist stormily in spite of this, then the patient should have irrigation of the kidney pelvis or possibly even nephrotomy or nephrectomy.

Mere persistence of pyuria, on the other hand, is to be expected and need occasion no undue alarm, if the patient be symptomless, and especially if there is no fever and no leucocytosis. Such patients usually go to full term with normal labor and puerperium, immune apparently from risks of their infection. EDWARD L. CORNELL.

LABOR AND ITS COMPLICATIONS

Palmer, C. B.: Obstetrical Anæsthesia. *Calif. St. J. Med.*, 1918, xvi, 175.

For the past few months in the Division of Obstetrics and Gynecology of the Stanford University Medical School, nitrous oxide-oxygen has been administered to all patients in labor who could pay a given sum for the gas and for those who, for any reason, presented contra-indications to the use of ether, whether they could pay for the gas or not.

Nitrous oxide-oxygen certainly does not delay labor in the second stage and may be given in such a way as to shorten the duration of this stage. When forceps are indicated, continuous nitrous oxide-oxygen analgesia or a moderate degree of anæsthesia is eminently satisfactory, with possibly the addition of a very small amount of ether at the perineal stage to secure relaxation.

The addition of a small quantity of ether, without any diminution or even a slight increase in the percentage of oxygen, is a relatively harmless procedure, while the attempt to secure relaxation by decreasing the amount of oxygen beyond certain limits is always dangerous and especially so in obstetrics.

When version or any other procedure requiring relaxation is indicated, nitrous oxide-oxygen-ether or ether-oxygen is unquestionably the safest for the fœtus and probably for the mother as well.

The effect of this anæsthesia on postpartum hæmorrhage, lacerations, and cæsarean section is discussed.

The school is able to give gas for obstetrical cases at a cost of $2.50 to each patient.

In the series of cases since they commenced giving gas to all obstetrical patients who so desired, there are 201, of which number 83 had nitrous oxide-oxygen followed by ether; 81 had ether and 18 had no anæsthetic. These last were mainly patients who entered the hospital a few minutes before delivery. Their records are complete in all respects except for some gaps in the duration of the various stages. EDWARD L. CORNELL.

PUERPERIUM AND ITS COMPLICATIONS

Infantozzi, J.: Treatment of Puerperal Endometritis by Permanent Drainage (Tratamiento de la endometritis puerperal por el drenage a permanencia). *Rev. argent. de obst. y ginec.*, 1918, ii, 59.

For some years in the obstetrical clinic of the Faculty of Medicine in Montevideo it has been the custom to treat puerperal infection localized in the endometrium by placing a permanent glass drainage tube followed by intra-uterine instillation of antiseptic fluid. The method has undergone various modifications.

The author is of the opinion that large, repeated, and continuous intra-uterine irrigations are dangerous and should not be systematically employed. Instrumental curettage of the infected uterine mucosa has disastrous effects and ought never to be practised since it always destroys the granular barrier of the endometrium. When there are remnants in the infected uterine cavity, curettage, either digital or with a blunt spoon, may prudently be done, which respects the uterine wall. If this is neglected, the infection may spread and become generalized.

Rubber tubes are not generally satisfactory for draining the uterus, since they become clogged easily; if they must be used they should be of large caliber. The Mouchotte tube does not drain the uterus well and at times produces gangrene of the cervical mucosa. It obstructs rather than drains. Glass tubes have none of these disadvantages and keep the uterus perfectly permeable. Those employed by the author are specially made of different shapes and with numerous perforations.

Intra-uterine instillations of 5 per cent glycero- or creosoto-turpentine or of the Carrel fluid have none of the disadvantages of the large intra-uterine irrigations commonly practised.

The only serious drawback in the placing of the drainage tube is the possible inoculation of the healthy endometrium by streptococci, gonococci, etc., existing in the external genital passages.

This however can easily be avoided by careful examination and by not placing the tube unless the uterine musoca is infected, making a previous careful disinfection of the vulva, vagina, and uterine neck.

For the past two years out of 1,870 maternity cases 249 were treated for infection. Of these 81 were infected abortion cases.

There were 27 deaths. The author is satisfied that by early application of his method spread of the infection which threatened the life of the patient has been avoided. W. A. BRENNAN.

Watson, B. P., and Scott, W. A.: Analysis of Clinical Types of Puerperal Fever, with Special Reference to Prognosis and Treatment. *Canad. M. Ass. J.*, 1918, viii, 321.

The authors have made an analysis of the clinical types of puerperal fever occurring in the obstetrical department of the Toronto General Hospital and those cases already infected that were sent into the gynecological service for the two years ending December 31, 1916. From the obstetrical service there were 2,096 cases. Of these 476, or 22.9 per cent, showed morbidity. There were 97 cases from the gynecological service.

From this study they draw the following conclusions:

1. In 85 per cent of cases developing fever in the puerperium, the fever quickly subsides without any definite pathological lesion developing.

2. When a definite pathological lesion does develop, it does not manifest itself for some time after the first rise of temperature.

3. When a definite pathological lesion is present in the pelvis, the infection starts as a wound infection of some part of the genital tract.

4. The primary infection may remain localized for varying lengths of time, or it may spread by: (a) continuity; (b) the blood-stream; (c) the lymphatics.

5. The lesions arising from the spread of infection by continuity of the tissues are usually either pus tubes, pelvic peritonitis, or a general peritonitis. The most common causative organisms are the gonococcus and streptococcus. Lesions due to the gonococcus appear late in the puerperium, whereas those from the streptococcus appear early and the prognosis is not so good.

6. Infections spreading by the blood-stream are usually of the thrombophlebitic type, which ordinarily begins in the thrombosed veins of the placental site, but may occasionally arise from a primary infection in the perineum or vagina.

7. Infections which spread by the lymphatics in most instances give rise either to a cellulitis or to a septicæmia. This is the most serious type of puerperal infection and usually causes death.

8. The type of organism is not of so much importance as the situation in which that organism is growing, i. e., as the anatomical lesion.

9. There is at present no means of treating primary infection in the uterus which does not at the same time favor extension of the inflammatory process to the surrounding tissues or the blood-stream.

10. All cases should, therefore, be treated expectantly during the early stages.

11. When a definite pelvic lesion does develop, it should be dealt with along the lines of established procedures.

12. The pathological process of puerperal fever is the same whether the sepsis follows labor or abortion. HARVEY B. MATTHEWS.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Black, K.: Case of Calculous Pyonephrosis. *Indian M. Gaz.*, 1918, liii, 60.

Black reports a patient aged forty-two who was admitted to the Gerard Freeman Thomas War Hospital, Bombay, with a discharging sinus in the right loin. Trouble began with debility and weakness one year previous. There was no colic or pain in the loin; this had developed insidiously. An abscess was opened and drained, leaving a persisting sinus in the right loin. The patient had some fever. No trace of urine came from the sinus, as was determined by administering methylene blue by mouth. X-ray examinations were negative for the left kidney, but on the right side a dark shadow was evident suggesting a calculus.

As a urethral stricture was present, internal urethrotomy was done followed by cystoscopy. The bladder interior was seen to be trabeculated; there was no cystitis. Pus was seen coming from the right ureter; clear urine came from the left. The ureters were catheterized; pure pus was obtained from the right kidney and normal urine from the left kidney.

Assisted by Macqueen, Black did a right kidney removal through incision in the right loin. The kidney was found very much enlarged and adherent to the surrounding tissues, which were exceedingly fatty and fibrous. On opening the kidney it was found to be a loculated shell full of pus, containing several small calculi in the lower part of the pelvis. The patient made a rapid recovery, and was discharged apparently completely cured five weeks after operation.

A colored plate illustrating the pathology of the kidney accompanies the article.

H. W. E. WALTHER.

Culver, H., Herrold, R. D., and Phifer, F. M.: Renal Infections; a Clinical and Bacteriologic Study. *J. Am. M. Ass.*, 1918, lxx, 1444.

A report is made of a study of 116 instances of non-surgical, non-tuberculous renal infections, of which 31 per cent were in males and 69 per cent in females. But 12 of these patients had other abnormalities of the urinary tract, while 36 had demonstrable lesions outside the urinary tract, leaving 58 per cent with no abnormal conditions other than the renal infection.

Bilateral infections were found in 58 per cent and unilateral infections in 42 per cent of the patients. Of the unilateral infections the right side had 52 per cent, against 48 per cent for the left.

The symptoms were found to be variable; but three symptoms were much more common than the others and may be considered the cardinal symptoms of renal infections: chills and fever, present in 49 per cent, pain in the back in 45 per cent, and frequent painful urination in 40 per cent of all patients.

Cystoscopically normal bladders were found in 32 per cent of the patients, while the others presented varying degrees of hyperæmia and œdema depending upon the degree of vesical inflammatory reaction.

Bacteriological studies revealed the colon bacillus in pure culture in 74 per cent of the cases, while it was found in 85 per cent either in one or mixed culture; the staphylococcus was found in pure culture in 8 per cent and altogether in 16 per cent of the patients. Organisms occasionally found were streptococci, typhoid bacilli, pyocyaneus, diphtheroids and leptothrix, but in general it may be said that renal infection is caused either by the colon bacillus or the staphylococcus.

These infections were wrongly diagnosed in many instances. Such diagnosis as renal calculus, pneumonia, typhoid fever, salpingitis, appendicitis and sciatica being among the most common mistaken diagnoses.

The treatment consisted of internal administration of hexamethylenamine alternating with alkalies, and where possible, local treatment by pelvic irrigation was carried out. Only those cases were considered cured that presented sterile catheterized ureteral urine on two successive examinations one week apart.

Cases are cited to emphasize that disappearance of symptoms is not synonymous with cure, as such patients are prone to return with exacerbations, while those bacteriologically cured have had no recurrence.

The authors find that the irrigation treatment is more efficacious in colon bacillus that in staphylococcus infections, which is in accord with the histopathologic differences in these two types of infection.

HARRY CULVER.

Martin, S. P.: Hydronephrosis as an Underlying Cause in Attacks of Acute Abdominal Pain. *N. Y. M. J.*, 1918, cvii, 834.

The author demonstrates the possibility of a hydronephrosis as the underlying cause in all doubtful cases of attacks of acute abdominal pain.

The renal pelvis as well as its ureter may become dilated at any period of life and in either sex as the result of the following conditions: (1) mechanical obstruction; (2) infections; and (3) tumor.

As the result of constant mechanical obstruction to the ureter, that portion of the ureter above the obstruction and the renal pelvis will become dilated, the dilatation varying in amount according to the duration and extent of the obstruction. The dila-

tation is also accompanied subjectively by pain. The pain varies in intensity from a slight dull ache to severe, sharp, knife-like attacks radiating from the loin or epigastrium on the affected side down across the lower abdomen into the genitalia, often so severe that opiates are required before relief is obtained. The patient may be told, especially if the pain has been on the right side, that he has appendicitis. An appendicectomy may then be performed and, the attacks of pain still persisting, the patient is frequently subjected to a second operation for the removal of the gall-bladder, or if the patient is a women, often an ovary. Still no relief is obtained and the patient then goes from one physician to another, being treated for neurosis, lumbago, ptosis, indigestion, and so forth, while the real underlying cause of the trouble is entirely overlooked.

This is the type of case that should have a complete urological examination to determine the possible existence of a hydronephrosis. As a rule, with hydronephrosis of moderate degree the demonstration of more or less obstruction to the ureteral catheter in the upper ureter and following this the existence of residual urine beyond the obstruction which is characterized by its rapid flow will suffice to call attention to the probable exstence of a hydronephrosis. Should any doubt arise, however, the condition can be further demonstrated by means of the over-distention method. Thus if an ounce or more of sterile solution can be injected into the renal pelvis without any evidence of return flow around the catheter before pain is caused, it is safe to say that hydronephrosis is present.

The pathological changes that take place in a hydronephrosis may be summed up as follows: At first only the ureter, pelvis, and calyces are dilated, but sooner or later, if the condition persist, the kidney substance is thinned out and stretched over the distended calyces until the parenchyma has almost disappeared and the kidney is represented only by a mere shell surrounding a loculi of fluid. The surface often appears lobulated, resembling a fœtal kidney.

The histological changes that take place depending on the duration of the obstruction are as follows:

1. There is a dilatation of the tubules with flattening and atrophy of the lining cells, many of which are shed.

2. The cells of the interstitial tissue have multiplied and produced a fibrocellular network filled with round cells around the tubules. Interstitial hæmorrhages will be seen when the blood-vessels have been pressed upon.

3. The tubules have undergone atrophy and may have disappeared, their places being taken by fibrous tissue.

4. Bowman's capsules are at first distended with fluid and the glomeruli are pushed aside, but finally they are replaced by fibrous tissue and disappear.

The outline of the normal renal pelvis may assume a great variety of sizes and shapes, depending to some extent on the degree of distention by the injected medium. Unless the pelvis is fully distended, its exact outline cannot be accurately ascertained. Incomplete distention may give an erroneous impression of the outline and may lead to error in interpretation.

The author demonstrates on plates the normal renal pelvis and different types of hydronephrosis.

THEO. DROZDOWITZ.

Bugbee, H. G.: The Management of Renal Tuberculosis. *Surg., Gynec. & Obst.*, 1918, xxvi, 479.

This article dealing with the pathology, diagnosis and treatment of renal tuberculosis is based upon the study of five cases reported in detail.

The author quotes freely from the literature on the subject and summarizes the present status of renal tuberculosis as follows:

1. Renal tuberculosis may be a primary lesion and arise from a filtration of tubercle bacilli from the blood stream into the parenchyma or tubules of the kidney, where tissue changes similar to those found in tuberculous foci in other parts of the body take place.

2. An effort is always made to wall off the process, but the formation of antibodies is so slow, and the immunity of the patient, which may always have been absent or which may have been temporarily diminished, is so low that the lesion usually gets beyond control, and usually goes on to wide destruction of the kidney and extension to the other kidney, to other parts of the urinary tract and of the body.

3. From the nature of the lesion, remissions are common.

4. The symptoms of renal tuberculosis are misleading, often slight at onset, and give no indication of the extent of the lesion.

5. The diagnosis of renal tuberculosis may be simple or may be the most difficult of all urinary lesions, often requiring preliminary treatment to allay acute symptoms and repeated cystoscopic examinations over a long period of time.

6. The treatment cannot be outlined from a study of symptoms. The remissions of symptoms often for long periods of time should not be accepted as a cure.

7. The effort on the part of nature to inhibit the progress of the disease and to limit the lesion should be borne in mind, utilized and encouraged in every possible manner in inoperable cases, as well as before and after operation.

8. While many others have had cases similar to two of the author's, where the active tuberculous process has been arrested and walled off, still this is not the rule, the lesion being progressive. Even when arrested, a kidney which is the site of poorly drained cavities is a menace to the system. Therefore nephrectomy is the proper treatment.

9. With the means at hand by which one can often make an early and accurate diagnosis of renal

tuberculosis and with statistics showing that 75 per cent of the cases of infections are cured by nephrectomy, the tendency is to be too optimistic as to the future of these cases.

They should all report regularly, be watched and treated as cases of general tuberculosis.

H. G. HAMER.

Moore, C. U.: Renal Function Test in Children. *Northwest Med.*, 1918, xvii, 78.

As to how many and what tests are essential to an accurate understanding of the severity of a kidney lesion or lesions, there is some difference of opinion, yet most laboratory men agree that the more tests that can be made in a given case the better. Moore makes mention of the uric acid of the blood determination, urea nitrogen of blood and urine, Ambard's coefficient, creatinin, alkali reserve of the plasma, and sugar of the blood.

Short biochemic tests are now available, by means of which degrees of renal impairment may be determined. Moore reviews the ones clinically applicable. Where blood can be obtained he states that the estimation of its urea nitrogen gives data of immense importance in diagnosis, prognosis, and treatment. Where the blood cannot be obtained, the phenolsulphonephthalein test can usually be applied.

Acidosis can be diagnosed early and its degree measured by determining the alkali reserve of the plasma. The alveolar carbon dioxide tension stands next in importance. Acetonuria may or may not accompany acidosis.

In selected cases the test meal for renal function gives valuable therapeutic data.

Moore presents two cases which illustrate the value of a thorough laboratory investigation of the acute nephritides in children. H. W. E. WALTHER.

Tenney, B.: Renal and Ureteral Stone. *Boston M. & S. J.*, 1918, clxxviii, 731.

The relative frequency of urinary stone is indicated by the fact that the diagnosis of stone in the urinary tract was made in one per cent of the total surgical admissions to the two largest Boston hospitals in a five-year period.

The origin of these stones is not yet fully understood but may be a combination of bacterial action and mechanical obstruction in some portion of the kidney.

Crystalline deposits in the kidney substance may be produced experimentally and are not rare in the human kidney. Symptoms appear when their migration is stopped by some irregularity of a kidney calyx, a narrow spot in the ureter, obstruction at the bladder outlet, or in the urethra.

Urinary obstruction is more common than any one cause, but the subjective symptoms are much the same, whatever the cause. A stone which is not obstructing the flow of urine may produce such mild and indefinite symptoms that its discovery by X-ray or in the course of some abdominal operation may be unexpected.

The characteristic symptoms of renal and ureteral stone are hæmaturia, subcostal or vesical pain, and frequent urination. This combination never exists without some serious lesion in the urinary tract, though the lesion may not be an obstructing stone. On the other hand, a stone may lie in the kidney, ureter, or bladder for long periods without producing any of these symptoms.

The X-ray gives valuable assistance in diagnosis but cannot be trusted implicitly. The cystoscope and ureteral catheter sometimes give a positive diagnosis but more often contribute their share of the evidence. With these aids and a careful history, a definite and accurate diagnosis can be made in most cases.

The only treatment is removal through the natural passages or by direct operation. Without operative treatment a relatively small stone may be expelled. If the stone is lodged in the ureter, the discomfort and disability may be greater than if the stone is free in the kidney pelvis. The stone may increase in size as shown in X-ray plates taken three years apart.

For operative treatment pyelotomy is preferred to nephrotomy, and immediate suture is advised both for incisions in the kidney pelvis and the ureter.

Removal of urinary stones usually leaves untouched the anatomical conditions which accompanied their formation and discovery; therefore the author is in favor of Fowler's suggestion of altering the axis of the kidney after removal of renal stone and of occasionally dilating the ureter after the removal of ureteral calculi.

Eisendrath, D. N.: Varieties of Ureteral Strictures. *Surg. Clin. Chicago*, 1918, ii, 95.

The author reports a case of congenital stricture of the ureter in a young man twenty-nine years old who had symptoms for the past eight years of chills, fever, and pain in the right lumbar region. The diagnosis of gall-bladder infection was made, and the individual underwent operation with no relief. When he was correctly diagnosed and operated upon, the relief was immediate and permanent.

The author shows the value of cystoscopy and ureteral catheterization combined with pyelography in this type of case.

A phenolsulphonephthalein functional test was made on the opposite kidney and consequently the author knew that he could remove the infected right kidney with very slight operative risk to the patient. There were many adhesions around the infected kidney, and the only way it could be removed was by the subcapsular method of nephrectomy.

Stricture of the ureter may be classified as: (a) congenital, including (1) valve formation; (2) actual narrowing more or less complete; (3) spiral twists; (b) including under extrinsic causes (1) com-

pression by neoplasms; (2) accessory vessels to the lower kidney; (3) trauma to the peri-ureteral tissues; and under (c) intrinsic causes (1) inflammatory; (2) secondary to tuberculosis of the kidney or bladder; (3) secondary to impacted calculus; (4) primary carcinoma of the ureter.

The author showed cases of congenital stricture of the ureter and discussed the etiology, pathology, and symptomatology very thoroughly. He also showed cases due to external trauma and internal trauma from calculi impacted in the ureter causing ulcerative lesions whose subsequent healing produced stenosis.

The author sums up his work as follows:

The clinical pictures under which ureteral strictures appear are, as a rule, the following:

1. Recurrent attacks of colic-like pain similating appendicitis, ureteral calculi, and kinking of the ureter due to movable kidney. In every doubtful case of appendicitis one should never neglect a thorough examination of the urinary tract as a routine procedure before operation is done.

2. The appearance of a tumor in the kidney region may be the first sign of the presence of a stricture or obstruction of the ureter.

3. Evidences of renal infection, chills, fever, etc., with or without previous symptoms, like tumor or ureteral colic, may be the predominant feature of the case.

4. Unusually severe reactions from ureteral catheterization, either in the form of pain or symptoms of infection, are recorded by Hunner as of great importance in leading one to suspect the presence of ureteral stricture.

Instrumental examination, i.e., the introduction of bougies of different calibers, supplemented by ureteral pyelography, is the only accurate method of making a diagnosis of ureteral stricture when a renal tumor is not present. In passing the ureteral bougies or catheters in suspected cases one must not overlook the fact that the instrument may catch in the folds of mucous membrane and in the inexperienced hand lead to the diagnosis of true ureteral obstruction. For the purpose of determining the caliber of the stricture, the use of a set of bougies like those shown in an accompanying figure is necessary. These are easier to insert, as a rule, in the female than in the male. Garceau's tapering catheter is also of grat value in the diagnosis and treatment of such strictures. If the presence of infection contraindicates the use of the dilating bougies or if the stricture is of an impermeable character, operative procedures must be considered.

For stricture at the upper portions of the ureter a form of plastic operation after the manner of performing pyeloplasty by the Heineke method has been successful in a number of cases. End-to-end anastomosis and similar methods of ureteral anastomosis have never been successful in the human on account of the infection present, as well as the tendency to stricture formation at the point of anastomosis.

At the lower end of the ureter if the dilatation is unsuccessful one must consider the advisability of dividing the ureter above the point of stenosis and reimplanting it into the bladder by one of the generally accepted methods of performing this operation.

In cases of impermeable stricture and in those accompanied by a considerable degree of hydronephrosis, as in the case reported, nephrectomy with removal of the ureter down to the point of stricture as the only method of procedure.

Operative treatment of congenital strictures does not differ from that of the acquired variety except that the question of operative procedure is much more difficult to solve on account of the enormous dilatation, with the resulting thinning of the walls of the ureter above the point of stenosis.

V. D. LESPINASSE.

BLADDER, URETHRA, AND PENIS

Borobio, P.: Bladder Calculi in Infancy (Los cálculos vesicales en el nino). *Arch. Espan. de Pediat.*, 1918, ii, 65.

The author thinks that textbooks on pediatric surgery do not give to bladder calculi the importance they deserve. In the course of a practice of thirty years he has met and operated upon 68 such cases in his pediatric clinic in Saragossa.

Bladder calculi in children occur most frequently from the second to the fifth year. The ages in the author's cases were as follows: two years old, 4 cases; three years old, 11 cases; four years old, 13 cases; five years old, 9 cases; six years old, 8 cases; seven years old, 5 cases; eight to thirteen years old, 18 cases. Two were female and 66 were male children.

The chemical composition of the calculi was in 5 cases uric; in 24 cases oxalic; in 35 cases phosphatic; in 4 cases mixed.

The general rule is that the calculus is single; multiple calculi are rare. In only three of the cases were two stones found, and in no case more than two.

The presence of a bladder calculus is revealed by three symptoms: pain, urinary incontinence, and hæmaturia. Pain is never absent. There is painful and difficult micturition. Incontinence is the rule, though it is not so constant a symptom as pain. It is varied in degree and kind. True hæmaturia is very rare in the calculous child and the author has never seen it in any of his cases.

A child with a history of long-continued suffering on urinating, with intense pain, incontinence, and occasionally the expulsion of a drop or two of blood, who does not respond to medical treatment, may be presumed to have a vesical calculus. The diagnosis can usually be verified by catheter examination and radioscopy. In 9 cases out of 10 the metallic sound will meet the calculus. But such cases in which the catheter fails can easily be determined by radioscopy. Even the uric acid calculi give positive findings.

The author reviews the various operative procedures for bladder calculi. For various reasons he considers most of them inapplicable to young children but thinks that suprapubic or hypogastric cystotomy is the operative method of choice in the child. It has none of the grave inconveniences of the perineal route, it is relatively easy, and has a well established technique which does not call for a specialist.

Borobio uses chloroform as an anæsthetic. He does not use a Peterson rectal inflator. The bladder is injected with boric solution; lateral retractors are placed and also a retractor on the superior angle of the wound and fundus of the prevesical sac. The bladder is incised and the calculus is extracted by forceps. There is no lavage. In his first 23 cases the Perier-Guyon syphon tube was used, but in the remaining cases the bladder was sutured with very fine silk in a single plane. In closing the opening a drainage tube is placed in Retzius' space, and a Nelaton urethral sound remains for five or six days.

The author's mortality for the hypogastric operation has been 6 per cent. The deaths which were due to urinary infection occurred from the fifth to the eighth day.

Borobio is satisfied that vesical calculi recur. In his 66 cases there were 3 recurrences, or about 5 per cent. W. A. BRENNAN.

Cook, P. H.: An Unusual Case of Vesical Calculus. *Interst. M. J.*, 1918, xxv, 419.

Cook reports a patient thirty years of age who had a right inguinal herniotomy three years before. Eighteen months after the operation urinary symptoms developed, the cause of which was diagnosed by one man as a neoplasm. Local treatment however removed the symptoms for a year; then they reappeared with greater severity. A cystoscopic examination by another man resulted in a diagnosis of vesical diverticulation with stone formation. Radiograms showed an oval stone just to one side of the midline. Cystoscopy one week later again showed the stone, but no diverticulum was present. The stone proved to be hanging from the wall of the bladder by one of the silk sutures of the hernia operation. Its removal was followed by uneventful recovery.

HARRY CULVER.

Loumeau: A Large Vesical Calculus Dating from Infancy (Gros calcul vésical de l'enfance). *Gaz. hebd. d. sc. méd. de Bordeaux*, 1918, xxxix, 53.

Loumeau recently removed from a young man aged twenty-two a vesical calculus weighing 100 grams, as large as a fair sized potato. It was removed by the hypogastric route. The calculus was composed chiefly of uric acid covered with a thin coating of phosphates.

The size of the stone and a history of bladder troubles left little doubt that its formation began at about the age of eight years at least. Since then the patient suffered much pain which became exaggerated with the progress of time. There was frequent painful micturition and incontinence up to the sixteenth year, succeeded by incessant polyuria, etc. He was called to military service and his case was treated as a congenital stricture of the urethra. He was finally transferred to the author.

He then showed purulent, bloody and fetid urine. In spite of most desperate efforts he could not empty the bladder. A bougie introduced into the bladder gave negative results. A metallic sound introduced later discovered the calculus, which was removed under a suprapubic cystotomy. The bladder wall was much thickened, the stone being fixed on the right side below and behind the corresponding prostatic lobe, which also was much congested and enlarged. The patient recovered after a slight postoperative infection of the wound and an abscess of the right prostatic lobe. W. A. BRENNAN.

Cathelin, F.: War Wounds of the Bladder (Blessures de guerre de la vessie). *Lyon chirurg.*, 1918, xv, 109.

Cathelin's study of bladder war wounds is based on the personal observation of 29 cases; 15 of these were shell wounds and 14 were bullet wounds. Sixteen entered posteriorly or in the ischiatic region, 11 being right-sided; 7 were anterior, pubic or suprapubic; 4 were lateral in entrance. In only 5 cases was there an outlet orifice, and in the same number of cases there was a concomitant wound of the rectum.

With regard to symptomatology, in 17 cases there was an issue of urine through the orifice; in 11 cases there was hæmaturia, two being very severe and almost fatal. In one of these the hæmorrhage was primary, in the other secondary. In 7 cases there was primary retention of urine; in 5, signs of cystitis. In three cases there was an injury of the pelvic bones, there being in these cases no calculus in the bladder. This shows how the statistics of different authors vary, since Legueu has noted 10 vesical calculi associated with 10 fractures of the pelvic girdle, although in 22 cases of wound without fracture he found no calculus.

With reference to the projectile, in 8 cases it was in the bladder; in 4 cases there were secondary calculi; in 4 cases there were bone spicula in the bladder.

The method of exploration was in 10 cases cystoscopy, in 10 radiographic and in 5 cases radioscopic examination.

Spontaneous expulsion of a foreign body from the bladder in the course of miction occurs only when the body is very small. Ablation by the natural route depends on the size of the foreign body, and the surgeon must decide on the possibility of this method.

When operative intervention is necessary Cathelin considers the hypogastric route the best, as it is simple and rapid. The perineal route traumatizes the urethra and is liable to cause incontinence. But whatever may be the method of procedure, the removal of foreign bodies in the bladder has a good

immediate and late prognosis. Immediate suprapubic cystotomy is recommended in the following cases: (1) in profuse hæmaturia with anterior perforation of the bladder or with a posterior entrance without exit; (2) in peritonitis following intraperitoneal injury; (3) in associated lesions involving the rectum. Cathelin recommends Freyer's technique for cystotomy. The mucous membrane of the bladder should not be sutured to the skin.

With regard to associated injuries and secondary lesions, it is observed that about one-third of the bladder injuries submitted to an early operation at the front have later to undergo further operative treatment in the interior hospitals, either for a persistent fistula, an eventration of the wall, or on account of incomplete exploration which has left a second foreign body in the bladder. Hence Cathelin strongly recommends suprapubic deviation of the urine as the primary operation, especially in the conditions above mentioned, a permanent catheter being fixed to the skin by a few stitches. Later in the rear prosthetic hospitals operations and the removal of foreign bodies can be done when necessary.

The results obtained by Cathelin in his 29 cases were 26 recoveries and 3 deaths. Two of the deaths were immediate owing to the gravity of the cases and one was due to tetanus developing eight days after operation. There were 2 cases of iliac anus and three developed abscesses in the vicinity.

While surgery may save the patient with a serious bladder injury, yet Cathelin thinks that as a matter of prophylaxis the bladder should be emptied before soldiers go into action. If an abdominal injury is then received, it will involve the intestine alone, usually without an associated bladder injury, and will render the prognosis much brighter. Many bladder wounds can be avoided by systematic orders to this effect by regimental commanders.

W. A. Brennan.

Mendez, A.: Vesical Miasis (Miasis vesical). *Rev. de med. y ciruj.*, Habana, 1918, xxiii, 185.

In a very large bladder calculus removed from a patient after hypogastric section a number of larvæ of miasis belonging to the group lucilia macellaria were found. The larvæ, which emerged from small peripheral orifices of the calculus, were similar to those met with in nasal, auricular, and cutaneous miasis. The species referred to is quite common over the whole American continent.

The vesical variety is explained by eggs deposited in the urethra carried into the bladder and giving origin there to the larvæ. W. A. Brennan.

Pedersen, J.: The Proof of Cure in Gonococcic Urethritis. *Internat. J. Surg.*, 1918, xxxi, 168.

The author says the chief concern at the present time must of necessity be prevention by treatment, and the ability to decide when the infected have become free from infection.

He says the test period depends on the estimate of three factors: (1) the virulence of the infection; (2) its hold upon the patient as measured by the complications he has had; (3) his power of resistance or recuperation.

The present tests are: (1) the provocative test, by allowing the patient to drink freely of beer; by instilling a solution of silver nitrate into the whole urethra, or by giving him a full dose of an antigonococcus vaccine; (2) microscopical examination after staining the secretion expressed from the seminal vesicles and prostate; (3) culture of the expressed secretion; (4) the complement fixation test.

Pedersen claims that a test practical and at the same time clinically reliable is the combination of the provocative test and culture of the expressed secretion. An instillation of nitrate of silver solution is more convenient for a provocative test than resorting to beer or to a vaccine. The combined test is made at intervals of from one to four weeks until two consecutive negative tests have been obtained; the patient may then be dismissed. Louis Gross.

GENITAL ORGANS

Lespinasse, V. D.: Impotency; Its Treatment by Transplantation of Testicle. *Surg. Clin. Chicago*, 1918, ii, 281.

The author insists that an accurate diagnosis of the type of impotency should be made in each case. They should be classified according to the following table:

1. Loss of testicles, (a) by accident; (b) by disease.
2. Psychic changes.
3. Structural changes in the central nervous system, particularly injuries and diseases of the spinal cord.
4. Hypoplasia of the testicle, (a) congenital; (b) acquired (internal secretion cases).

Congenital and acquired hypoplasia of the testicle are the only types of impotency that should be treated by transplantation of the testicle.

The psychic and the structural type of case should have appropriate treatment directed toward their etiological factor or factors. The etiological factor in the hypoplasia of the testicle case is the absence of the internal secretion of the testicle. This can be corrected by feeding large amounts of desiccated animal testicle or by transplantation of the human testicle.

The two techniques used to transplant human testicles are en masse or by morcellation. In the author's work he has used the morcellation method entirely. Transplantation with blood-vessel anastomosis is of interest only from a scientific and experimental standpoint and has not proved practical clinically.

The changes occurring in the transplanted testicle are well shown by two photomicrographs showing the interstitial cells of Leydig together with their granules. The results in some of these cases of transplanted testicle are little short of marvelous; in others the results are not so good.

Hyman, A.: Anatomic Results after Prostatectomy. *Internat. J. Surg.*, 1918, xxxi, 158.

The author has made a study of the mechanism of urination following suprapubic prostatectomy and the changes in the topography of the bladder resulting from the operation, that additional light may be cast upon the question of postoperative incontinence of urine.

Considerable discrepancy exists concerning the rôles played by the internal and external sphincters. In order to better determine the changes following the operation, Hyman made a series of radiographs of unoperated cases, with the result that marked changes of the bladder were observed. Changes characteristic of prostatic enlargement were found at the base of the bladder, the inferior portion of the bladder was found to be broad and flat or sinuous; at times there was an upward bulging, due to the gland projecting into the bladder. He considered the flattening of the inferior portion of the organ due to the prostatic enlargement. The bladder was situated on a higher plane than normal, the level depending upon the size of the gland. Its base was found to be opposite the upper border of the symphysis, or more often one or two centimeters higher. Even in the most extreme distention of the bladder, the internal sphincter is the seat of closure.

The author selected 38 prostatectomies for this study, and 75 radiographs were taken at various intervals following operation, ranging from two months to three years; the most interesting changes were noted at the outlet of the bladder. In a small group of cases the internal sphincter was not sufficiently injured by the operation to interfere with its proper function. In the great majority of the cases, the radiographs showed two distinct cavities, a larger, superior one corresponding to the bladder proper, and a smaller, inferior one extending from the lower margin of the bladder and continuous with it, to the region of the "compressor urethræ," the latter corresponding to the defect left by the removal of the enlarged gland.

Radiographs taken after an interval of three years show that the sphincter has either partially regenerated after the operation or was incompletely destroyed by it, and that the cavity left by the enucleation of the gland is not entirely obliterated, and that the internal sphincter is not completely regenerated.

In conclusion, the author says that: (1) the internal vesical sphincter is the true sphincter of the normal bladder, and of the bladder in prostatic enlargement; (2) the "compressor urethræ" is the functioning sphincter after suprapubic prostatectomy in the large majority of cases. LOUIS GROSS.

Martin, C.: End-Results in the Prostatectomized Patient; a Comparative Analysis, Based on 110 Cases. *J. Am. M. Ass.*, 1918, lxx, 1287.

By means of a printed questionnaire sent to a considerable number of general practitioners, Martin has collected important data regarding the end-results in 110 prostatectomized patients, 55 of whom were operated upon suprapubically and 55 perineally. The operations had been performed by urologists, general surgeons, general practitioners, and gynecologists. Attention is called to the even balance in numbers of each type of operation, showing that the perineal route is still in favor in many instances; however, 1916 statistics give the perineal route but two-thirds the number of the suprapubic.

In this series the ages of the patients operated upon suprapubically averaged two years greater than those operated upon perineally. While 61 per cent of the suprapubic wounds were closed within four weeks, only 42 per cent of the perineals were so fortunate; and whereas 100 per cent of the suprapubic wounds were closed within one year only, only 84 per cent of the perineals had done so, 6 per cent of the remainder having permanent fistulæ.

Since frequency of urination is often the symptom which brings the patient to seek surgical relief, the changes in this factor were carefully analyzed, showing that among the suprapubic cases the day results were good in 81 per cent, fair in 13.5 per cent, and poor in 5.4 per cent; while among the perineal cases the day results were good in 66 per cent, fair in 27.7 per cent, and poor in 5.5 per cent. As to nocturnal frequency, the results from suprapubic operation were good in 82 per cent, fair in 5 per cent, and poor in 11 per cent; while in perineal cases the results were good in 44 per cent, fair in 23 per cent, and poor in 31 per cent of cases.

Concerning bladder control, 80 per cent of the suprapubics have full control, 15 per cent partial control, and 4.3 per cent complete incontinence, whereas 64 per cent of the perineals have full control, 22 per cent partial control, and 14 per cent complete incontinence.

The comfort of the patient depends to no small degree upon the extent of cystitis, hence this element is of importance and it has been found that 35 per cent of the suprapubic have some degree of cystitis, while 31 per cent of the perineals are so afflicted; again, where 21 per cent of the former class have some type of pain, only 16 per cent of the latter are thus bothered.

The preponderance of urethral trauma following perineal operation is clearly shown when it is seen that 23.2 per cent of these patients have actual urethral stricture resulting, against 6.5 per cent for the suprapubic route. This factor may also be of importance in the production of vesical calculi, since 4.1 per cent of the perineals later developed stone, while none of the suprapubic were found to be thus complicated.

There are no marked differences observed in the force of the stream or the character of the urine of the two routes; the effect on the sexual power of the patients is somewhat more favorable in the suprapubic, as also is the effect on the general health of the individuals.

Martin believes that it is well that the perineal operation is losing favor, as in practically all of the consequential factors analyzed, the suprapubic method has a big advantage in results obtained.

HARRY CULVER.

MISCELLANEOUS

Chalier, A., and Glénard, R.: War Wounds of the Genito-Urinary Organs (Plaies des organes génito-urinaires). *Rev. de chir.*, Par., 1917, liii, 552.

The authors had 15 cases of extensive urethral injuries, of which detailed clinical histories are given; 12 of these were bullet wounds and 3 were shell wounds. The penile urethra was the site in 5 cases, the perineoscrotal in 9, and the prostatic urethra in 1. In the majority of the cases the trajectory of the projectile was anteroposterior. In a few cases the course was from the front backward, irregularly oblique or transverse. The direction of the trajectory is determined by its entry and outlet orifices where both exist, or by radiography, except in cases where it is observed at operation. In 9 of the cases the lesion found at operation consisted of a complete or incomplete section of the urethra. The cases of complete section were distributed as follows: balanic portion, 1 case; sub-balanic portion, 1 case; penoscrotal angle, 1 case; perineoscrotal, 2 cases. The maximum separation of the two ends did not exceed 2 cm.

Clinically urethral wounds show urethrorrhagia and disturbances of miction. In only severe cases does retention persist beyond the first twenty-four hours; catheterization is then possible. In the majority of cases the patient urinates spontaneously partly or wholly through the external wound. Such symptoms exist in two-thirds of the cases, and are very valuable when a lesion of the canal is not known positively or suspected. Infectiye phenomena are later and less severe in urethral wounds than in wounds of other regions.

The treatment of urethral war wounds does not essentially differ from the treatment of such wounds in civil practice. Generally injuries of the penile urethra not interfering with miction do not call for immediate intervention; on the contrary, perineoscrotal or prostatic urethral wounds call for operation as early as possible; this as a rule should be an external urethrotomy. In 12 of the authors' cases a wide perineotomy and exposure of the wound was done, thus assuring a free outlet for the urine without the use of a retention catheter and avoiding peri-urethral infection. The lesion is generally easily found, and when section is incomplete, there is only slight separation and urethrorrhaphy can be done. When the urethral lesion is very profound and cannot be reached easily through the perineum, the best course to follow is a suprapubic cystostomy. The immediate mortality of the authors' cases has been 13.3 per cent, but such wounds are usually associated with other injuries more or less severe. In the fatal cases the result was not due directly to the urethral lesion, and the authors consider that the immediate prognosis of urethral wounds is benign. As regards end-results, one case of a prostatic urethral wound died, and two others had stenosis which called for dilatation.

The authors say that war wounds of the penis and scrotum are fairly frequent. Penile injuries, though superficial, may be very extensive, and there may be almost complete circular decortication. In a general way deep penile wounds are not so grave as they might at first appear. Even if there is complete or incomplete urethral section, this lesion is relatively benign. Moreover, though the corpus cavernosa and gland are highly vascular, formidable hæmorrhages calling for a hæmostatic operation do not occur. Lesions of the gland have however this particularity, that they often end in necrosis with loss of detached parts even when the pedicle uniting them with the gland is assured of nutrition. At the same time there is observed a very rapid cicatrization of the remaining part. This effect is observed even when the two parts have been united by sutures.

As regards scrotal wounds, it is of prime importance to know what has happened to the testicles. Some authors hold that the testicle, owing to its mobility, escapes a bullet traversing the scrotum. The authors think this is incorrect. They find that a partial or total testicular hernia through the wound is the rule; sometimes the two testicles herniate at the same time. The testicle itself may be simply perforated, it may be divided into two parts, or it may be completely disruptured.

In all testicular lesions the authors have followed a strictly conservative policy, even when the wound is old. The scrotum is opened up, dressed and the testicle as far as possible left undisturbed. The testicle is maintained as far as possible in its correct place in the scrotum and no attempt is made at either suture or reconstruction unless the injury is comparatively recent, which has not been the cases in the authors' series. If in spite of every effort the testicle remains more or less ectopic and adherent to the envelopes, it will be easy to free and replace it later in its proper position. Examination of cases after a long interval where the testicles were preserved has shown the authors that after having eliminated part of their substance as necrotic, such testicles, even if atrophied, have been non-painful. For various reasons the authors consider such preservation is justified.

In a case of complete section of the spermatic cord the testicle was completely removed on the sixth day. In another case in which the cord was necrotic due to infection, the authors ligated the cord and removed the necrotic testicle. Recovery was rapid.

W. A. BRENNAN.

SURGERY OF THE EYE AND EAR

EYE

Roy, D.: Removal of Foreign Bodies from the Eyeball and Orbital Cavity; Report of Cases. *South. M. J.*, 1918, xi, 386.

The author reports better results from the use of the hand electromagnet such as Johnson's, introducing the point within the eye, than the Haab giant magnet.

Five cases of foreign body injury are cited.

In Case 1 a particle of steel had cut through the cornea and lodged in the posterior chamber and phthisis bulbi would have been the prognosis. After removal the pupillary area became filled with cicatricial exudate and opaque lens matter, yet an iridectomy gave 20:70 vision.

In Case 2 a particle of brass was hidden behind and so entangled in the iris that it could only be removed by pulling the iris upward from the pupillary border when the assistant could see and grasp the piece, the iris dropping back without injury or distortion of the pupil.

Cases 3, 4 and 5 are of steel or shot in the sclera or orbital tissues, and the author says, "When one considers the damage that can be done by surgical interference to muscles, nerves, and blood-vessels in the deeper parts of the orbit, a conservative course is the better one, the foreign body being allowed to remain unless there is urgent demand for its removal." S. S. Howe.

Hoare, W. W.: Some Points in the Operative Technique and After-Treatment of Senile Cataract Extraction. *Med. J. Austral.*, 1918, i, 297.

The various modifications of the operation for cataract the author compares to the many procedures used for hæmorrhoids, suggesting that the differences are due less to the value of the methods than to personal adaptation or initial success or failure.

Waiting for maturity with its accompanying blindness is ill-advised, as good results having been obtained from operating on immature as on mature cataracts, visual failure below seeing ordinary objects determining the time for operation.

A ring-shaped incision of the anterior capsule, getting the cystotome well under the edge of the iris sphincter all around, and irrigation of the anterior chamber, renders iritis or later capsulolenticular cataract unlikely. Argyrol, 25 per cent, is used three times a day for three days before operation.

The Langs retractor is used by the assistant to hold the lids away from the eye and the operator's feeling of security is regarded as outbalancing the objection of having the assistant's hands in the way.

Peripheral iridectomy is done, as the usual coloboma causes too much dazzling, especially in the Queensland climate, and it is also not so desirable cosmetically. A moderately large lens can be extracted through a small pupil if done slowly, remembering that the sphincter pupillæ can be tired out just as the sphincter ani. Eserine, 0.5 per cent, is instilled to guard against iris prolapse. Aged patients are gotten out of bed in two days when possible and the eye protected by only a wire mask when once the wound is sealed. S. S. Howe.

Carhart, W. M. D.: Differential Diagnosis and Treatment of Follicular Conjunctivitis. *Med. Rec.*, 1918, xciii, 540.

Much good and no harm is done by sending children with follicular conjunctivitis to the Children's Clinic with the diagnosis of trachoma, as the vigorous treatment clears up both diseases and isolates all trachoma cases.

The author enumerates the points of differential diagnosis between the two diseases, emphasizing the deep location of the follicles in trachoma and the enlargement of the capillaries between them, the mucous membrane in follicular conjunctivitis being normal.

A very early sign of trachoma, noticed quite often, is an involvement of the ocular conjunctiva in the form of a ring of gelatinous granules deep in the fornix and gradually spreading forward to a considerable distance on the eyeball. This can be demonstrated by causing the patient to look down very strongly and then gently raising, not everting, the upper lid.

Follicular conjunctivitis should be treated carefully, not because it is in itself a dangerous disease, but because more serious infection is practically invited. This explains cases which apparently begin as a follicular conjunctivitis and then develop suspicious symptoms leading one to doubt the first diagnosis. The author recommends 5 per cent copper citrate ointment and massage, either in the form of the bichloride rub or of opthalmol solution on a cotton wound applicator. S. S. Howe.

Murray, W. R.: The Vestibular Apparatus and Its Relation to Aviation. *J.-Lancet*, 1918, xxxviii, 155.

The anatomy and physiology of the semicircular canals and cochlea are briefly reviewed.

A stimulus applied to one semicircular canal determines the integrity not only of that canal but also of the pathway leading to the eye muscles and the cortical centers of the brain. The ability of the individual to maintain equilibrium depends on his vestibular apparatus, his visual apparatus, and his muscle sense. Deprivation of two of these

results in serious trouble, while loss of one factor still permits equilibrium. This is illustrated by the tabetic who has lost the muscle or arthrodial sense, by the deaf mute who has lost both internal ears, and by the blind who have only vestibular and muscle sense remaining. It is of the utmost importance that the aviator should possess all three, and most important is the vestibular apparatus, as when flying in clouds he must depend on this to maintain balance and orientation.

Impairment of the function of one or more of the semicircular canals may be the result of scarlet fever or other infection, hearing may be perfect, and on the ground the individual may apparently have a normal sense of equilibrium.

The method of examining the vestibular apparatus has been standardized by the army and is carried out by means of the turning chair, supplemented by the caloric test which has the advantage of testing the labyrinths separately. In the routine examination only the turning tests are used, the caloric being reserved for doubtful cases or to confirm the findings. The examination consists of the nystagmus tests to determine direction, amplitude, and duration of the nystagmus, past pointing to determine the vertigo induced by stimulation of the horizontal canals, and falling tests to determine vertigo due to stimulation of the vertical canals. Abnormal reaction is a cause for rejection.

S. S. Howe.

Brose, L. D.: Ocular Tuberculosis. *J. Indiana St. M. Ass.*, 1918, xi, 113.

In the conjunctiva one may meet with three varieties of tuberculosis: (a) an acute miliary form, rapid in course, involving by choice the tarsal covering; (b) an ulcerative form of long duration; and (c) a diffuse swelling of the conjunctiva with follicular enlargement affecting usually one eye and accompanied by little pain, even though the cornea be involved.

Phlyctenular conjunctivitis is not regarded as tubercular, the fact that tubercle bacilli have been found in the lesions being explained by the high percentage of infections with tuberculosis, the findings being contaminations from foci elsewhere.

Foreign bodies bearing tubercle bacilli, by getting into the eye render infection possible, and Fuchs cites the fact that such ulceration is frequently seen beginning in the sulcus subtarsalis where foreign bodies usually lodge.

Tarsal and lid ulcers are treated by focusing the sun's rays for a few minutes every three or four days on the ulcerated surface, and in the follicular form carbon dioxide snow may be used.

Scleritis, keratoscleritis, and episcleritis have in recent years been more and more connected with tubercular infection, especially with nodular formations.

The diagnosis of tuberculosis rests on macroscopical appearances, histological examination, experimental test implanting a portion of tissue in a rabbit's eye, and the biological reaction with tuberculin. The cause and nature of the tuberculin reaction, no matter which preparation is used, is the same, the difference being simply one of degree. The most plausible theory is that a toxæmia is brought about, the tissue cells resist the specific toxins by forming antibodies, and these protect against further invasion. It is proper to administer tuberculin as an antigen, but one must not expect the production of antibodies with equivalent immunizing value such as occurs in typhoid fever serum, for tuberculin is of far more value as a diagnostic agent than as a curative one.

The Calmette method is not without danger of permanent injury to the diseased eye.

S. S. Howe.

Fernandez, J. S.: Diseases of the Eyes in Cuba. *N. Orl. M. & S. J.*, 1918, lxx, 717.

The history of scientific work in Cuba dates from the taking of Havana by the English in 1861. Knowledge of the eye was not cultivated and the first notice of Cuban ophthalmology was by Carron du Villards, an Italian, who states that the eye disease brought from Africa by negro slaves was not trachoma, and if trachoma ever got a foothold it did not thrive because of the regard for the living conditions of their costly chattels by the plantation owners. The visit of du Villards to the home of yellow fever is regarded as noteworthy, as such temerity cost Valli, of Pisa, and Antommarchi, physician to Napoleon I, their lives.

Quinine amblyopia was common forty years ago owing to the massive doses used, but few cases are seen now because of more rational treatment.

Pure nicotine amblyopias, without the addition of alcohol, are often observed, but in the war in 1875 with the increase in the consumption of alcohol, and less food, visual disturbance was very frequent.

Lacrymal disease is scarcely found in Cuba owing to the wide lacrymal canals of the natives.

Hemeralopia, as observed in sailors and sponge fishermen, the author attributes to the intense light and anæmia.

S. S. Howe.

Green, J., Jr.: The Treatment of Pneumococcus Ulcer of the Cornea with the Thermophore. *South. M. J.*, 1918, xi, 251.

Experimentally and clinically Green has confirmed the value of the thermophore as developed by Shahan in the treatment of pneumococcic ulcers of the cornea. The method followed was the direct application of a metal tip at a temperature of 158° F. to the ulcer for one minute. Experimentally the cultures following this were negative and the clinical results satisfactory.

E. B. Fowler.

Carr, A. M.: The Narrowing of the Pupil Does Not Lower Normal Intra-Ocular Tension. *Arch. Ophth.*, 1918, xlvii, 177.

The desirability of determining if myotics cause lowering of normal intra-ocular tension is shown in

three types of cases: (a) borderline glaucoma, in which a tension of 25 mm. is often noted and may or may not be reduced by a myotic; (b) simple glaucoma in one and normal tension in the other; and (c) inflammatory glaucoma in one eye and normal tension in the other eye.

The Schiotz tonometer was used and the tension taken before and after the instillation of 1 or 2 per cent of eserine salicylate in patients who gave no history of eye trouble and whose ages varied from twelve to sixty-seven years. In no case was there a lowering of tension greater than three mm. following the contraction of the pupil.

The author does not however postulate that decrease of tension under a myotic necessarily means that an eye is glaucomatous. S. S. Howe.

EAR

Stimson, G. W.: The Static Labyrinth. *N. Y. M. J.*, 1918, cvii, 539.

The author states that the static labyrinth is not the only organ of equilibrium, as it is in intimate connection with other special senses, such as sight, touch, muscle and joint sense in the maintenance of balance. But the end-organ of the static sense differs from the others in that its only function is that of the maintenance of balance, whereas with the others it is merely a collateral function. Therefore, whenever perfect equilibration is interfered with and the sensation of vertigo is produced, the attention should chiefly be directed to the static labyrinth.

The various conditions causing vertigo are:

1. Primary disease of the labyrinth, labyrinthitis of the various types, hæmorrhage or effusions; embolus of the labyrinthine artery, e.g., air embolus in caisson workers; irritation of the labyrinth occurring during a middle ear inflammation, such as acute otitis media; sudden destruction of the labyrinth, rarely by trauma, but usually by hæmorrhage or serous effusion, in diabetes, Bright's disease, or where the vascular system is affected; neuritis of the eighth nerve resulting from some chronic focus of infection, such as chronic disease of the faucial tonsils, pyorrhœa alveolaris, etc.; most frequently of all a primary chronic degenerative process within the labyrinth, independent of syphilis or infectious fevers.

2. Toxæmias affecting the vestibular apparatus, such as ptomaine poisoning, constipation, alcohol, quinine, tobacco, lead poisoning, nephritis, gout, rheumatism, syphilis, and infectious fevers such as scarlatina, typhoid, mumps, etc.

3. Definite lesions within the brain itself along the pathways from the ear, such as tumor, hæmorrhage, thrombus, infarct, abscess, gumma, tubercle, specific neuritis, multiple sclerosis, syringomyelia, polio-encephalitis, or meningitis.

The information to be derived from the ear tests consists of the presence or absence of normal reactions, or their deviations from the normal. If after stimulation there occur no reactions whatsoever, no nystagmus, no vertigo, no past pointing, no falling, etc., the lesion is either in the labyrinth or the eighth nerve. If stimulation of the labyrinth evokes perfectly normal responses, nystagmus and vertigo, there is evidently no impairment of the vestibular apparatus, and if it is for a cause of dizziness that one is searching, he must look elsewhere for something that is producing an irritation of the balance mechanism. If any of the responses go through normally, the labyrinth and eighth nerve as the seat of the lesion are eliminated. If stimulaton of the ear fails to produce any nystagmus, there must be a lesion along the pathway from the ear to the eyes in the vestibulo-ocular tract. If no vertigo results, there is a lesion along the pathway from the ear to the cerebral cortex, the vestibulo-cerebello-cerebral tract.

If after stimu ation the patient shows nystagmus and no vertigo, or vertigo and no nystagmus, the lesion is not labyrinthine. The presence of normal nystagmus with absence of vertigo would indicate a normal tract from the ear to the eyes but an involvement of the other pathway, the one from the ear to the cerebrum, after the two have divided into their individual tracts, i.e., between Deiter's nucleus and the cerebral cortex. The presence of a normal vertigo and the absence of nystagmus would indicate a lesion along the fibers going to the eye muscle nuclei at some point beyond the division of the two pathways into their individual tracts, i.e., between Deiter's nucleus and the posterior longitudinal bundle.

In conclusion, the author summarizes as follows:

The static labyrinth is the essential organ of balance.

The labyrinth, together with its various nerve pathways, constitutes the vestibular apparatus or balance mechanism.

A disturbance of any portion of the vestibular apparatus gives rise to vertigo.

It is only a disturbance of the ear or its associated pathways, and nothing else, that can induce vertigo. When disease in remote organs causes dizziness, it is only because of a definite influence on the ear mechanism.

These tests afford an accurate and scientific method of determining the integrity of the internal ears, the eighth nerves, and the pathways through the medulla oblongata, the pons, the six cerebellar peduncles, the cerebellum itself, and the cerebral crura to the cerebral cortex.

In cases of vertigo of doubtful etiology, examine the vestibular apparatus. Otto M. Rott.

Huntington, W. H.: Mastoiditis. *Med. Rec.*, 1918, xciii, 849.

After a few historical and anatomical remarks, the author discusses: (1) the etiology, stating that adenoid hypertrophy is one of the greatest etiological factors in middle ear trouble and subsequent mastoid invasion; (2) symptomatology; (3) diagnosis

and aids to same; (4) indications and contra-indications to the operation.

The following indications are mentioned:

1. Cases of acute mastoiditis, with persistent pain on pressure over the tip or antrum. Persistence of fever after a successful paracentesis has been done, or in which a sagging of the postero-superior meatal wall is found.

2. Cases of acute suppuration of the middle ear with dizziness, vomiting, nausea, or beginning facial paralysis, or with signs of intracranial or labyrinthine involvement.

3. Cases of long-standing middle ear suppuration which resist all local measures, and because of good hearing and other reasons do not indicate a radical mastoid.

4. Cases of persistent mastoid pain, either with or without other symptoms, which cannot be accounted for in other ways.

5. Cases of subperiosteal abscess.

OTTO M. ROTT.

Hays, H.: Tubercular Mastoiditis; Radical Operation Under Cocaine Anæsthesia. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 938.

From a case of tuberculous mastoiditis upon whom a radical operation under cocaine anæsthesia was performed, the author has deduced the following practical points:

1. The radical operation can be done under local anæsthesia without pain.

2. The superficial scalp tissues and periosteum are sensitive, but bone has absolutely no sensation.

3. The mucosa of the middle ear is extremely sensitive and must be separately cocainized.

4. Irritation or destruction of the facial nerve is immediately noticeable to the patient.

5. The after-effects are practically nil.

6. The end-result is just as good under local as under general anæsthesia. OTTO M. ROTT.

MacKenzie, G. W.: Syphilis of the Inner Ear and Eighth Nerve. *Am. J. Syphilis*, 1918, ii, 241.

The points of chief interest to which the author draws attention are:

1. That syphilitic changes in the inner ear are due to extension from either the nerve on the one side or the middle ear on the other.

2. From present knowledge, it is accepted that: (a) primary atrophy of the eighth as well as the second nerve is an accompanying manifestation of parasyphilis; (b) primary atrophy is produced by a pre-existing low grade syphilitic meningitis; (c) eventually the pia mater contracts and squeezes the life out of the nerve.

3. In those cases where the syphilitic meningitis is more pronounced, the inflammation spreads to and involves the nerve, so that the clinical evidence of neuritis manifests itself simultaneously with or shortly following the meningitis. At a later period the connective tissue elements in the nerve may contract and produce secondary atrophy.

4. Bilateral diminution or complete loss of hearing when found to be due to a lesion of the perceiving apparatus as determined by carefully conducted functional fork tests speaks decidedly for the diagnosis of syphilis.

5. Bilateral diminution or loss of the so-called turning, caloric and galvanic tests likewise speaks for syphilis.

6. Bilateral diminution or complete loss of hearing function from a lesion in the perceiving apparatus combined with bilateral diminution or loss of vestibular function speaks for syphilis.

7. Pronounced loss of either function on one side with but moderate diminution of function on the other speaks equally strong for syphilis.

OTTO M. ROTT.

Maybaum, J. L.: Factors in the Causation of Tinnitus Aurium. *N. Y. M. J.*, 1918, cvii, 780.

The author goes into considerable detail in discussing the various manifold causes of dizziness. He divides all cases into two classes:

1. Tinnitus without defective hearing, due to functional disturbance of the auditory nerve center, functional disturbance of the labyrinth, or abnormal condition of the circulatory system.

2. Tinnitus with deafness, due to a pathological condition in the external, middle, or internal ear.

In the former class are those conditions due to arteriosclerosis, anæmia, epilepsy, migraine, toxæmias from overindulgence in alcohol, tobacco and drugs such as quinine and the salicylates. Finally neurasthenia is a factor.

So many helpful suggestions are scattered throughout the article that it is impossible to present them all in a short abstract. For these a careful perusal of the original article is necessary. The following are a few selected at random:

1. It is important in giving a prognosis, to select the facts as to the constancy or intermittency of the noise. The latter type offers a better prognosis, as the causative factor is less likely to be of a permanent nature.

2. Continuous noises may disappear only after the patient becomes completely deaf.

3. Relief following catheterization of the eustachian tube is a favorable sign.

4. In general, the chances for recovery from tinnitus are less hopeful than relief from deafness.

5. It is important to remember that persistent and prolonged treatment is fraught with greater harm to these patients with middle ear disease than entire neglect of treatment. A far better plan is to give two or three courses of treatment of a few weeks' duration with sufficient intervals between them.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Stein, O. J.: Pituitary Tumors from the Surgical Standpoint of the Rhinologist. *N. Y. M. J.*, 1918, cvii, 585.

Speaking of the various ways in which the sella region has been reached endonasally, the author mentions the midnasal method by which the septum is followed all through the operation, the object being to enter the sphenoid sinus and remove its septum and that part of its upper and back wall constituting the floor of the sella upon which the hypophyseal gland rests. Some operators begin the incision external to the nose, others start far back on the septum, while still others, among whom is the author, start in front on the septum, performing first the classical submucous resection of the septum.

Besides this midnasal method are mentioned the lateral nasal method, by which the septum is left intact and the sphenoid is approached either through the nostril by removing one or both turbinates and exenterating the ethmoid labyrinth or by making an entrance first through the maxillary antrum from the oral cavity and then into the ethmoid region. The third method is a combination of the midnasal and the lateral methods.

The points mentioned in favor of the midnasal method are: (1) It is safer because the operation is confined between the membraneous flaps of the septum which are brought together afterward, thus shutting off the sphenosella operated area from the nose entirely. (2) Although not the shortest route, it is the more direct because it has the septum as a guide which makes working more certain. (3) It has not the disadvantages of the lateral method which is oblique, and by which the operator must assure himself beforehand of the presence of a sphenoid cell, as well as its size and location, and besides, if a posterior ethmoid cell should occupy the ordinary site of the sphenoid cell, embarrassment may ensue, or the cell may be so small as to limit one's approach to the sella floor.

Whatever method is selected, the author urges the most intimate co-operation with the internist, the neurologist, the ophthalmologist and the roentgenologist.

Several anatomical and pathological findings are mentioned, for which the original article should be read. The principal changes in the gland are hyperplasia, adenomata and cysts.

The author has had experience with nine cases, six males and three females, the ages ranging from thirty to sixty-six years. The chief symptom in all but one was loss of vision. Three showed marked functional pituitary disturbance. Headache was present to some degree in all. In one it was very severe and almost the only symptom. Eight of the nine cases were operated upon, and the immediate results from operation were a great improvement in symptoms in five. One patient died on the third day, presumably from acidosis; no autopsy was done. One case was complicated by meningitis, but the patient survived. One had a slight hæmorrhage in the left hemisphere but completely recovered in a few days.

The remote effects from operation show one death after one and one-half years from a cyst that was apparently not present at the time the operation was performed, when a large decompression was done for an adenoma. There was a disappearance of the headache in most cases; also the vertigo when present. Sight continued to improve or was maintained in those showing immediate benefits.

OTTO M. ROTT.

THROAT

Beck, J. C.: Further Report on the Treatment of Malignant Disease of the Larynx; Management and Statistics of Malignant Disease of the Respiratory Tract. *Laryngoscope*, 1918, xxviii, 131.

The author discusses: (1) the Percy coagulation method; (2) the diathermia mummification method; (3) deep X-ray penetration; (4) radium in massive doses; and (5) laryngectomy.

The Percy coagulation method was employed in 23 cases as follows: sarcoma, intranasal, 1 case; carcinoma, extranasal, 1 case; carcinoma of the upper jaw, 7 cases; carcinoma of the upper and lower jaw, 2 cases; carcinoma of the naso-, oro- and hypopharynx, 1 case; carcinoma of the lips, 2 cases; carcinoma of the thyroid gland, 1 case; carcinoma of the external ear, 1 case; carcinoma of the tongue, 3 cases; carcinoma of the larynx, 4 cases.

The ultimate cicatricial formation and tenacity of the necrotic mass produced by the method are the objectionable features.

The reasons given for substituting a laryngotomy and removal of the growth by the Percy method for a laryngectomy are:

1. The patient will consent more readily to an operation when he may be promised that he may have a voice, even though it will not be normal.

2. He may even hope to have a normal breathing tube and not have to wear a permanent tracheotomy tube.

3. The operation is not so dangerous as a laryngectomy.

Ultimate results of cases treated are not given.

The diathermia method is mentioned but no results as to cure are cited.

Deep X-ray penetration has proven unsatisfactory for carcinoma, but good results have been obtained in the treatment of sarcoma. The author has had one case of sarcoma of the larynx thus treated with apparent success and several cases of maxillary postnasal and pharyngeal sarcoma which responded remarkably.

Massive doses of radium, 125 mg. for thirty-six hours, resulted in reduction in the size of the sarcomatous growth of the larynx, but the time element is too short to give data upon the ultimate result.

Laryngectomy was done in one case, but the ultimate result remains to be seen.

The author has records of 143 cases, 41 of sarcoma and 102 of carcinoma. Of the sarcoma cases 30 were accounted for at a recent date; 11 died. Of the carcinoma cases 73 were followed up to a recent date; 21 are still alive, and 52 dead.

In the paper these summaries are discussed in detail, as well as the report of 4 cases, the only living one of whom is the one on whom a laryngectomy was performed.

Concerning the management of these cases, the author speaks of:

1. The importance of joining the American Society for the Control of Cancer.

2. The earliest possible diagnosis is to be followed immediately by the most radical intervention. This does not always mean surgery.

3. All points of irritation, such as fissures, chronic inflammation, stones, non-malignant growths, foreign bodies and jagged edges, are to be looked upon as precancerous states and should be corrected.

4. When a malignant growth has assumed the proportions of a metastatic growth or involved the neighboring tissues to such an extent as to make life unbearable, were the cancer removed, then in such a case palliative treatment is indicated, and the limit of morphine should be given to prevent the patient from suffering any pain.

5. Should the growth be very large and involving the neighboring structure so completely as to probably leave a large defect in appearance as well as function, and furthermore, should the procedure appear to be so formidable as to offer only a small chance of a permanent cure from cancer, it is one's duty to operate and give such patients that chance.

6. In the removal of particles of tissue for microscopical examination, it must be borne in mind that cutting into a malignant growth will frequently aggravate the process or endanger the healthy neighboring regions from implantation of cancer cells. Consequently Bloodgood has recently recommended the use of an electrically heated knife which will prevent that difficulty and yet not spoil the tissue for correct microscopical diagnosis.

7. The follow-up system of cancer cases is of the utmost importance and the co-operation of the medical profession in making this of practical value is absolutely essential.

OTTO M. ROTT.

MOUTH

Haines, H. A.: Vincent's Angina from the Oral Surgical Standpoint. *Dental Cosmos*, 1918, lx, 295.

Haines calls attention to the importance of the diagnosing and treating of Vincent's angina by dentists. He defines it as an acute infection of the mouth caused by the action of bacillus fusiformis and a variety of spirillum. The period of incubation is six days. The patient complains of headache and malaise and the tongue is coated; the temperature very seldom exceeds 100° F. The gums around the second and third molars usually show ulceration which may travel forward upon the buccomucosa reflection and also extend backward toward the tonsil region. The ulcerative tissue is necrotic, the color of which is soft grey or a yellowish green.

He recommends treating these cases by giving the patient a laxative and washing the mouth with potassium permanganate solution of 1:3,000. Another treatment is to swab the ulcerated parts with the following preparations: copper sulphate, 10 per cent, Lugol's iodine, phenol in glycerine, 5 per cent, saturated solution of potassium permanganate.

M. N. FEDERSPIEL.

Ivy, R. H.: Anatomy of the Teeth and Jaws, with Special Reference to Roentgenogram Interpretation. *Internat. J. Orthodontia*, 1918, iv, 124.

The author calls attention to the fact that familiarity with the anatomy of the teeth and jaw-bones is one of the fundamental essentials for correct interpretation of roentgenograms of these parts. Lack of this knowledge is frequently a cause of the mistaking of normal shadows for manifestations of disease. The sockets of the teeth are lined with a thin plate of dense bone, which is shown in the X-ray negative as a fine white line around the tooth. Between this line and the tooth itself is a narrow dark space representing the peridental membrane. These lines are important landmarks in interpretation, as their absence or deviation usually means some pathologic condition.

Particular attention is called to the relation of the roots of the teeth to the floor of the maxillary sinus and nasal chamber, and normal anatomical variations are pointed out. Certain foramina and canals also normally appear in roentgenograms and might be mistaken for pathologic phenomena if their anatomical significance were not appreciated. These are the anterior palatine fossa, behind and between the roots of the upper central incisors; the posterior palatine canal, above the roots of the upper molar teeth; the mandibular canal, below the roots of the lower molar and premolar teeth; and the mental foramen, below and between the roots of the lower premolars.

Anatomical landmarks shown in lateral X-ray plates of the face are also pointed out, and illustrated by diagrams.

BIBLIOGRAPHY *of* CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

NOTE.—The bold face figures in brackets at the right of a reference indicate the page of this issue on which an abstract of the article referred to may be found.

Operative Surgery and Technique

Omission of dressings in surgical wounds. COVILLE. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 513.

A new method of tying a surgical knot. A. R. GRANT. Surg., Gynec. & Obst., 1918, xxvi, 559.

Exposure of deep vessels by wide routes of access. J. FIOLLE and J. DELMAS. Paris: Masson et Cie, 1917. **[196]**

Removal of projectile under the screen. MAUCLAIRE. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 12, 642.

The progress in extracting projectiles under screen control. I. FIEVEZ and P. TROUQUET. Progrès méd., Par., 1918, p. 203.

Lighting of operating room during operations done under intermittent screen control. R. LECLERC. J. de radiol., Par., 1918, iii, 19.

Cinematic plastics. G. VANGHETTI. Chir. di organ. d. mov., Bologna, 1918, ii, 1.

Some methods of splinting. F. J. STEWARD. Guy's Hosp. Gaz., 1918, xxxii, 153.

The preventive treatment of wound shock. W. B. CANNON, J. FRASER, and E. M. COWELL. J. Am. M. Ass., 1918, lxx, 618. **[199]**

Aseptic and Antiseptic Surgery

Treatment of war wounds (aseptic and open-air methods). F. A. BESLEY. Med. Bull., Par., 1918, i, 393.

Treatment of infected wounds in war. W. C. MOORE. Mississippi Valley M. J., 1918, xxv, 129.

Some principles involving the treatment of infected wounds. J. C. BLOODGOOD. J. M. Ass. Ga., 1918, viii, 9.

Acriflavine and proflavine; notes on their use in infected gunshot wounds. R. B. CARSLAW and W. TEMPLETON. Lancet, Lond., 1918, cxciv, 634.

Note on the treatment by brilliant green of recently inflicted gunshot wounds. R. MASSIE. Lancet, Lond., 1918, cxciv, 635.

The stability of an alkaline hypochlorite solution. A. F. MC CULLOCH. J. Roy. Army M. Corps, 1918, xxx, 522.

Biological study of the action of alkaline hypochlorites in the treatment of war wounds. N. FIESSINGER and R. CLOGNE. Rev. de chir., Par., 1918, liii, 264. **[201]**

Treatment of wounds by the Carrel method. G. LESTACHE. Pediat. Espan., 1918, vii, 166.

The Carrel method of wound treatment in the Hospital da Santa Casa de Misericordia. C. BARCELLOS. Brazil-méd., 1918, xxxii, 106.

Experiences with the Carrel-Dakin solution. P. V. TUXEN. Hosp.-Tid., Copenhagen, 1918, lxi, 422.

Results of the Carrel-Dakin method of wound treatment at the French front. A. H. EBELING. Am. J. Surg., 1918, xxxii, 118.

The use of dichloramine-T and a modified open-to-the-air treatment of burns. W. E. LEE and W. H. FURNESS. Therap. Gaz., 1918, xlii, 305.

Behavior of hypochlorite and of chloramine-T solutions in contact with necrotic and normal tissues in vivo. J. H. AUSTIN and H. D. TAYLOR. J. Exp. Med., 1918, xxvii, 627.

Treatment of septic gunshot wounds with hypochlorite solution. L. TORRACA. Clin. chir., Milano, 1917, xxvi, 47.

Sterilization of the skin and other surfaces by a mixture of crystal violet and brilliant green. V. BONNEY and C. H. BROWNING. Brit. M. J., 1918, i, 562.

The excision and suture of superficial gunshot wounds under local anæsthesia. S. BROCK. Surg., Gynec. & Obst., 1918, xxvi, 565.

The evolution of primary suture of war wounds. G. GROSS. Presse méd., Par., 1918, xxv, 225.

Primary suture of war wounds. G. GROSS, H. TISSIER, L. BOUDARD, F. DI CHIARA and L. GRIMAULT. Med. Bull., Par., 1918, i, 383.

Report of 2,537 cases of primary suture of war wounds. R. LEMAITRE. Lyon chirurg., 1918, xv, 65.

Suture of wounds in time of attack. MARQUIS, DESCAZAL, LUQUET, and MORLOT. Med. Bull., Par., 1918, i, 388.

Primary and delayed primary suture. G. F. GASK. Med. Bull., Par., 1918, i, 353.

Delayed primary and secondary suture. H. A. BALLANCE. Med. Bull., Par., 1918, i, 372.

Primary and secondary suture. POTHERAT and DELBET. Med. Bull., Par., 1918, i, 387.

Late suture of war wounds. A. CHALIER. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 657.

Suture at base hospitals. J. T. MORRISON. Med. Bull., Par., 1918, i, 364.

Treatment of warm abscesses by paralateral incision and immediate reunion. CHAPUT. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 531.

The microbic action of chlorine and oxygen in the nascent state. N. PANE. Riforma med., Napoli, 1918, xxxiv, 344.

Regarding Leriche's primary surgical clearance. H. CHAPUT. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 202.

Liquid-tight closure and the treatment of wounds. W. H. TAYLOR and N. B. TAYLOR. Lancet, Lond., 1918, cxciv, 671. **[201]**

Early and total discontinuance of dressings in surgical wounds. PHOCAS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 329. **[202]**

Incarcerated sepsis. A. E. MORISON. Lancet, Lond., 1918, cxciv, 535. **[202]**

The phagocytic response to the introduction of bacteria into clean wounds. W. J. WILSON. Brit. M. J., 1918, i, 533.

Antiseptic methods. C. WALLACE. Med. Bull., Par., 1918, i, 362.

Studies on sterilization by formol vapor. E. ROUSSEAU. J. de méd., Bordeaux, 1918, lxxxix, 130.

An analysis of the problem of infection. J. L. STODDARD and S. C. HARVEY. Mil. Surgeon, 1918, xlii, 519.

Anæsthetics

The practice of anæsthetics. E. H. EMBLEY. Med. J. Austral., 1918, i, 341, 366, 387.

Choosing the anæsthetist. I. JOSEPHSON. N. Y. M. J., 1918, cvii, 979.

The environment of anæsthesia. J. R. MC CURDY. Interst. M. J., 1918, xxv, 397.

Regarding chloroformization. AUVRAY. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 643.

Accidents of chloroform anæsthesia and of medullary anæsthesia. P. REYNIER. Bull. et mem. Soc. de chir. de Par., 1918, xliv, 504.

Use of chloro-ethyl in war surgery. H. VIGNES. Progrès méd., Par., 1918, p. 159.

General analgesia by oral administration. J. T. GWATHMEY and H. T. KARSNER. Brit. M. J., 1918, i, 254. **[203]**

Supraclavicular anæsthesia of the brachial plexus. S. LARRAINZAR. Therapia, Barcelona, 1918, x, 234.

New method of anæsthetizing the sacral roots. GIL VERNET. Rev. de cien. méd., Barcelona, 1918, xliv, 15.

Is the "choking" reputation of spinal anæsthesia justified? DESPLAT and MILLET. Presse méd., Par., 1918, xxv, 234.

The limitations of local anæsthesia in surgical operations. L. F. WATSON. Med. Fortnightly, 1918, l, 108.

Surgical Instruments and Apparatus

A new method for mounting dental films. W. L. SNIDER. Internat. J. Orthodontia, 1918, iv, 256.

A new tonsil guillotine. G. SLUDER. South. M. J., 1918, xi, 380.

A new bed device for facilitating the drainage of empyema thoracis. I. R. ROTH. J. Am. M. Ass., 1918, lxx, 1455.

An electro-operative bone clamp. F. H. ALBEE. N. Y. M. J., 1918, cvii, 913.

Apparatus for transport and definite treatment of war fractures of upper limb. F. ROSSI. Chir. di organ. d. mov., Bologna, 1918, ii, 83.

Description of an army apparatus for the upper limbs. P. DESCOMPS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 274.

Splints for use in arm, ankle, and leg injuries, with some observations on treatment. W. PEARSON. Lancet, Lond., 1918, cxciv, 670. **[203]**

An abduction splint for the femur. D. W. CRILE. Brit. M. J., 1918, i, 476. **[203]**

Simplification of suspension apparatus for treating fractures of lower limbs. I. VITRAC and L. MONGIE. J. de méd. de Bordeaux, 1918, lxxxix, 87.

Loop suspension in fractures of the thigh. HEITZ-BOYER and POULIQUEN. Med. Bull., Par., 1918, i, 395.

The present state of the apparatus question in lower limb fractures. H. P. ACHARD. Progrès méd., Par., 1918, p. 100.

A special crutch for men who have lost both an arm and leg. R. L. JOYNT. Brit. M. J., 1918, i, 508.

Padding Thomas extension splints by paraffin wax. R. L. JOYNT. Brit. M. J., 1918, i, 563.

A modification of Ultzmann's syringe for posterior urthral installations. F. HINMAN. J. Am. M. Ass., 1918, lxx, 1297.

The practicability of the modification of the lavatory chamber. Z. D. KLOPPER. J. Am. M. Ass., 1918, lxx, 1457.

SURGERY OF THE HEAD AND NECK

Head

Gunshots of the head, with especial reference to indications for operation and technique; demonstration of cases. K. SPEED. Surg. Clin. Chicago, 1918, ii, 79. **[204]**

Treatment of facial scars. A. POULARD. Presse méd., Par., 1918, xxv, 221.

Facial autoplastics. L. OMBREDANNE. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 592.

Treatment of cancer of the lip by radium; a report of 24 cases. H. H. JANEWAY. J. Am. M. Ass., 1918, lxx, 1051. **[205]**

Partial rhinoplasty by Italian method. F. GROSS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 235.

A typical radical treatment of double frontal sinusitis. P. LEDUC. Rev. de laryngol., Par., 1918, xxxi, 233.

The cause of lumbar puncture headache. R. G. MACROBERT. J. Am. M. Ass., 1918, lxx, 1350.

The return of tension and the occurrence of retrochoroidal hæmorrhage after trephining. A. KNAPP. Arch. Ophth., 1918, xlvii, 256.

Injuries to the malar bone and zygoma. T. W. TODD. Ann. Surg., Phila., 1918, lxvii, 403.

Loose cartilage in the temporomaxillary joint. R. J. BEHAN. Ann. Surg., Phila., 1918, lxvii, 536.

Radical surgery of the maxillary antrum with conductive or perineural anæsthesia. L. GATEWOOD. Internat. J. Surg., 1918, xxxi, 94. **[205]**

The effect of trauma upon the laryngeal nerves. E. S. JUDD, G. B. NEW, and F. C. MANN. Ann. Surg., Phila., 1918, lxvii, 257. **[205]**

Is the pineal body a gland or a vestige? F. TILNEY. N. Y. M. J., 1918, cvii, 887.

Fractures of the skull; the resulting intracranial pathology and the treatment. W. SHARPE. Med. & Surg., 1918, ii, 319. **[206]**

Penetrating cranial wounds of war. V. PAUCHET. Bull. méd., Par., 1918, xxxii, 239.

The subjective sequelæ of the commotional syndrome of cranial cerebral wounds. A. PITRES and L. MARCHAND. Presse méd., Par., 1918, xxv, 253.

Contribution to the cranial and cerebrocranial surgery of war. S. D'ESTE. Clin. chir., Milano, 1917, xxv, 225.

The paralytic syndrome of the last four cranial nerves, of traumatic origin. C. ROUBIER. Progrès méd., Par., 1918, p. 165.

Syphilitic paralysis of the fifth cranial nerve. C. D. CAMP. J. Mich. St. M. Soc., 1918, xvii, 194.

Replacement of scalp on a denuded dry skull by granulations secured through holes drilled in the bone. T. C. DAVISON. J. Am. M. Ass., 1918, lxx, 1368.

Cranioplasty by osteoperiosteal transplant. BEGOUIN. J. de méd. de Bordeaux, 1918, lxxxix, 102.

Cranial plastics by sterilized bone plate. SICARD, DAMBRIN, and ROGER. Bull. Acad. de méd., Par., 1918, lxxix, 331.

Cranial prosthetics. ESTOR and SENTIS. Rev. d'orthop., Par., 1918, vi, 151.

Report of a case of meningitis with some unusual features. C. E. PERKINS. Ann. Otol., Rhinol., & Laryngol., 1917, xxvi, 979.

Recovery of a case of purulent meningitis complicating mastoiditis. D. O. WALTHAL. J. Mich. St. M. Soc., 1918, xvii, 102. [207]

Notes on a case of meningitis of otitic origin. A. KAHN. Ann. Otol., Rhinol. & Laryngol., 1917, xxvi, 1004.

Diplococcal postoperative meningitis. J. LOCHELONGUE and J. DIDIER. Progr. s méd., Par., 1918, p. 151.

Late traumatic epilepsy. V. DEMOLE. Rev. méd. de la Suisse Rom., 1918, xxxviii, 263.

Hydrocephalus and microcephalus. GONZALEZ-ALVAREZ. Pediat. Espan., 1918, vii, 161.

Diagnosis and treatment of brain injuries with or without fracture of the skull. W. SHARPE. Am. J. Surg., 1918, xxxii, 109.

Treatment of war wounds of the brain and its coverings at casualty clearing stations. H. M. W. GRAY. N. Y. M. J., 1918, cvii, 407, 457. [207]

Study of a series of wounds involving the brain and its enveloping structures. H. CUSHING. Brit. J. Surg., 1918, v, 558. [209]

Treatment of cerebral abscess consecutive to war wounds. VILLANDRE and ROCHAIX. Ann. de méd., Par., 1918, v, 53.

A study of porencephaly with special reference to a case of a symmetrical lesion affecting the temporal poles of the cerebrum. J. R. D. HOLTBY. Med. Press, 1918, cv, 388, 407.

Traumatic cerebral œdema causing late signs of focal cortical irritation; report of case. G. E. ESPEJO. J. Am. M. Ass., 1918, lxx, 1278.

Cerebral œdema (excess cerebrospinal fluid); its causation and surgical treatment. L. B. RAWLING. Brit. M. J., 1918, i, 499.

Displacements of foreign bodies in the cerebrospinal axis. A. CORTESI and F. BONOLA. Riforma med., Napoli, 1918, xxxiv, 365.

Tumor of the cerebellopontine angle. E. D. FRIEDMAN. N. Y. M. J., 1918, cvii, 884.

Oculocerebellar syndrome and alternating hemiparesis due to a tumor of the posterior quadrigeminal eminence. A. SALMON. Riv. di patol. nerv. e ment., Firenze, 1917, xxii, 505. [213]

Diabetes insipidus from neurohypophyseal hæmorrhage. LUZZATO. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 142.

Some observations on the decompression operation on the hypophysis by the nasal route. O. J. STEIN. Laryngoscope, 1918, xxviii, 376.

Experimental hypophyseal lesions. A. CHIASSERINI. Policlin., Roma, 1918, xxv, sez. chir., 97.

Neck

Indications for removal of enlarged cervical lymphnodes. C. N. DOWD. N. Y. St. J. Med., 1918, xviii, 109. [213]

Gummous syphilis of the thyroid gland. F. E. SENEAR. Am. J. M. Sc., 1918, clv, 691.

The non-surgical treatment of Graves' disease; counterblast. T. B. SCOTT. Practitioner, Lond., 1918, c, 442.

Goiter. A. SIEBERT. Eclect. M. J., 1918, lxxviii, 222.

The toxic element in goiter. S. PERN. Med. J. Austral., 1918, i, 276.

Constitutional disturbance of toxic goiter as influenced by surgical therapy. C. H. FRAZIER. Penn. M. J., 1918, xxi, 510.

Exophthalmic goiter; the fallacy of surgery. I. BRAM. Med. Summary, 1918, xl, 69.

Some comments upon the probable cause of exophthalmic goiter. J. DUNN. Arch. Ophth., 1918, xlvii, 248.

The medical treatment of exophthalmic goiter. W. M. GREGORY. Ellingwood's Therap., 1918, xii, 169.

SURGERY OF THE CHEST

Chest Wall and Breast

A comparison between clinical and roentgen findings in diseases of the chest. H. D. CHAPIN. J. Am. M. Ass., 1918, lxx, 1357.

Intermittent hæmatemesis following on an injury to the chest. A. H. D. SMITH. Brit. M. J., 1918, i, 533.

Thoracotomy for penetrating wound of the chest; 194 cases of wounds of the chest followed by 22 thoracotomies for wounds of the lung. SOUBEYRAN and TRILLAT. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 552.

The treatment of carcinoma of the breast by the roentgen rays. R. H. BOGGS. Interst. M. J., 1918, xxv, 210. [214]

Pure sarcoma; cysts and dermoids of the breast. F. BINDI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 87.

Hoover's diagnostic signs elicited from the movements of the ribs. R. G. PEARCE. J. Lab. & Clin. Med., 1918, iii, 497.

Chondrocostal bilateral luxation spontaneous and recurring. J. HUBER and P. BRIAN. Bull. et mém. Soc. méd. d. hôp. de Par., 1918, xlii, 131.

Extraction of intrathoracic projectiles. RISS. Presse méd., Par., 1918, xxv, Supp. 268.

Penetrating thorax wounds. V. SAVIOZZI. Policlin., Roma, 1918, xxv, sez. prat., 441.

Hæmathorax in gunshot wounds. J. R. EASTMAN. Indianapolis M. J., 1918, xxi, 105. [214]

Spontaneous pneumothorax. P. H. PIERSON. Boston M. & S. J., 1918, clxxviii, 385. [214]

Spontaneous pneumothorax complicating pulmonary tuberculosis. H. F. GAMMONS. Boston M. & S. J., 1918, clxxviii, 637.

Artificial pneumothorax; a demonstration. F. W. WITTICH and E. S. MARRIETTE. J.-Lancet, 1918, xxxviii, 252.

The treatment of war cases of tuberculosis by an artificial pneumothorax. M. E. LAPHAM. Med. & Surg., 1918, ii, 443.

Interlobar empyema and other surgical complications of the thorax. W. BROADBENT. Brit. M. J., 1918, i, 529.

The treatment of empyema. E. MORELLI. Policlin., Roma, 1918, xxv, sez. med., 153. [215]

The treatment of tuberculous empyema. I. HOLMGREN. Nord. med. Ark., Stockholm, 1917, i, Inn. Med., No. 12. [215]

Study of projectiles buried in the mediastinum. R. LE FORT. Rev. de chir., Par., 1917, liii, 495.

The entrance of air into the mediastinum during operations on the base of the neck. C. G. BUFORD. Surg., Gynec. & Obst., 1918, xxvi, 540.

Trachea and Lungs

Rupture of the trachea without external wound following shell explosion. P. COUDRAY. Bull. Acad. de méd., Par., 1918, lxxix, 354.

Direct laryngoscopy in the treatment of chronic post-diphtheric laryngotracheal stenosis. H. L. LYNAH. N. Y. St. J. Med., 1918, xviii, 170.

Bronchoscopy and œsophagoscopy. T. E. CARMODY. Colorado Med., 1918, xv, 119.

The prevention of permanent bronchial fistula following lung resection. H. LILIENTHAL. Ann. Surg., Phila., 1918, lxvii, 538.

The dangers of late and incomplete operations in war wounds in pleura and lung. I. L. ROUX-BERGER. Presse méd., Par., 1918, xxvi, 269.

Report of 194 cases of chest wounds with 22 thoracotomies for lung wounds. SOUBEYRAN. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 552.

Diagnosis of early pulmonary tuberculosis. M. F. MORRIS. Med. & Surg., 1918, ii, 418.

A case of primary cancer of the lung. A. N. BLASCO. Prog. de la Clin., Madrid, Supp., 1918, vi, 105.

Rupture of the lung. H. F. GAMMONS. N. Eng. M. Gaz., 1918, liii, 274.

Lung abscess. N. W. GREEN. Ann. Surg., Phila., 1918, lxvii, 630.

The medical treatment of penetrating chest wounds by pulmonary antisepsis. P. DELAUNAY. Presse méd., Par. 1918, xxv, Supp. 318.

Heart and Vascular System

Immobility of the cardiopericardiac shadow as a pathognomonic sign of penetrating heart wound. COSTANTINI, VIGOT, and GOSSELIN. J. de méd., Par., 1918, iii, 12.

Intraventucular projectile; extraction, recovery. H. GAUDIER. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 232.

Perforating wound of the heart: death on the fifth day. C. F. WIGHTMAN. Brit. M. J., 1918, i, 534.

Shrapnel ball in the right heart. G. PISANO. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 75.

Immediate operation in war wounds of the heart. H. COSTANTINI and M. VIGOT. Rev. de chir., Par., 1917, liii, 383. **[216]**

Suppurative pericarditis and pericardotomy. M. L. GUILLERMO and J. M. MONTOYA. Repert. de med. y cirug., Bogotá, 1917, ix, 115. **[217]**

Pharynx and Oesophagus

Diathermy in cancer of the pharynx. D. M'KENZIE. Med. Press, 1918, cv, 337.

SURGERY OF THE ABDOMEN

Abdominal Wall and Peritoneum

Composite study of hypogastric artery and its branches. B. LIPSHUTZ. Ann. Surg., Phila., 1918, lxvii, 584.

The roentgen diagnosis of disease of the upper right abdominal quadrant. A. W. GEORGE, R. D. LEONARD, and F. W. O'BRIEN. Med. Clin. N. Am., 1918, i, 1007. **[217]**

Closure of the abdominal incision. C. G. CHILD, JR. Ann. Surg., Phila., 1918, lxvii, 578.

Postoperative gaps in the abdominal wall. R. C. BOYLE. Northwest Med., 1918, xvii, 142.

Pneumococcus peritonitis. P. SYMS. Ann. Surg., Phila., 1918, lxvii, 263. **[217]**

A case of acute tuberculous peritonitis in the course of paratyphoid fever simulating perforation. K. YACOUB. Practitioner, Lond., 1918, c, 452.

Rectus transposition in hernia. W. S. SCHLEY. Ann. Surg., Phila., 1918, lxvii, 624.

Sliding hernia. H. VON THUN. Nord. med. Ark., Stockholm, 1917, i, Kururgi, No. 18. **[218]**

Observations on the treatment of direct inguinal hernia in adults. L. W. HOTCHKISS. Tr. Am. Surg. Ass., Cincinnati, 1918, June. **[218]**

Reduction en masse of a strangulated direct inguinal hernia. H. H. RAYNER. Brit. M. J., 1918, i, 258. **[219]**

The importance of recognizing the weakness or the obliteration of the conjoined tendon in operations for inguinal hernia. J. C. BLOODGOOD. South. M. J., 1918, xi, 366.

Report of a case of an enormous postoperative ventral hernia. L. L. BOTTSFORD. J. Mich. St. M. Soc., 1918, xvii, 191.

Recurrences in operated crural herniæ and how to avoid them. A. C. LLADO. Prog. de la Clin., Madrid, 1918, vi, 105.

Spontaneous diaphragmatic hernia. G. PERALTA. Prog. de la Clin., Madrid, 1918, vi, 194.

Traumatic diaphragmatic hernia. P. GUIZZETTI. Riforma med., Napoli, 1918, xxxiv, 404.

Internal herniæ of the peritoneal fossæ. F. BOLOGNESI. Clin. chir., Milano, 1918, xxv, 250.

Observation on umbilical hernia. L. SEXTON. Interst. M. J., 1918, xxv, 374.

A case of adenoma of the umbilicus. C. H. WHITEFORD. Brit. M. J., 1918, i, 564.

Primary sarcoma in the omentum majus. S. VON STAPELMOHR. Nord. med. Ark., Stockholm, 1917, Kururgi, No. 21. **[219]**

Large mesenteric cyst removed by the vaginal route. A. CHUECO. Rev. argent. de obst. y. ginec., Buenos Aires, 1918, ii, 87. **[220]**

Embolism of the superior mesenteric artery, with report of case. F. R. SPARKS. J. Iowa St. M. Soc., 1918, viii, 182.

Gastro-Intestinal Tract

The radioscopic aspect of the stomach after a normal meal. F. RAMOND and P. A. CARRIE. Progrès méd., Par., 1918, p. 197.

A method of determining gastric motor efficiency. A. F. R. ANDRESEN. Med. Times, 1918, xlvi, 130.

Some clinical and experimental observations on gastric acidity use of the gas-chain method. G. L. MCWHORTER. Am. J. Sc., 1918, clv, 672.

Conservatism in roentgen diagnosis of disease of the stomach. W. H. MEYER. Med. Rec., 1918, xciii, 857.

Achylia gastrica and chronic connective tissue lientery; a clinical study of 322 cases. N. W. JONES. Am. J. M. Sc., 1918, clv, 335. **[220]**

Precolic gastro-intestinal anastomosis. R. FINOCHIETTO. Rev. Asoc. méd. argent., Buenos Aires, 1918, xxviii, 88. **[221]**

A case of trichobezoar; hairy tumor of the stomach. I. BRUCHI. Riforma med., Napoli, 1918, xxxiv, 327.

Roentgen rays as an aid in the diagnosis of ulcus ventriculi. I. W. HELD and M. H. GROSS. Am. J. M. Sc., 1918, clv, 713.

Peptic ulcer. J. B. DEAVER. Surg., Gynec. & Obst., 1918, xxvi, 489.

Stomach ulcers. CHAUFFARD. Rev. gén. de clin. et de thérap., Par., 1918, xxxii, 337.

Chronic gastric and duodenal ulcer. R. C. COFFEY. Med. Sentinel, 1918, xxvi, 149.

Perforated ulcer of stomach and duodenum. A. O. LOE. Northwest Med., 1918, xvii, 140.

The disturbances of acid secretion accompanying ulcer of the stomach or duodenum and the changes following operation. A. O. WILENSKY. Surg., Gynec. & Obst., 1918, xxvi, 506.

Acute gastroduodenal perforations. E. BUTLER. Calif. St. J. Med., 1918, xvi, 245.

Triple wounds of the stomach from a single intact bullet. N. KERR. Illinois M. J., 1918, xxxiii, 267. **[221]**

Surgical dyspepsia; a case report. C. W. ROBERTS. Atlanta J.-Rec. Med., 1918, lxiv, 349.

Choledocho-enterostomy for constricture of the common bile-duct following a perforated duodenal ulcer. W. A. SNEATH. Brit. M. J., 1918, i, 531.

Hæmorrhage after gastro-enterostomy. T. E. NEILL. Virg. M. Month., 1918, xlv, 43.

Pylorospasm and congenital pyloric stenosis; probably the earliest reported case. J. FOOTE. Am. J. Dis. Child., 1918, xv, 351.

The value of pyloric exclusion in the treatment of pyloric and duodenal ulcers. R. LEWISOHN. Ann. Surg., Phila., 1918, lxvii, 560.

Further experiences with the direct examination of the duodenal contents in affections of the gall-bladder and allied organs. M. EINHORN. Med. Rec., 1918, xciii, 885.

Two cases of acute arteriomesenteric duodenal occlusion. VENOT. J. de méd., Bordeaux, 1918, lxxxix, 140.

Importance of early diagnosis of intestinal obstruction. W. B. HOLDEN. Northwest Med., 1918, xvii, 148.

Intestinal obstruction. A. S. MONRO. Northwest Med., 1918, xvii, 147.

Congenital intestinal obstruction, with the report of a case. A. V. ST. GEORGE. Am. J. Dis. Child., 1918, xv, 354.

Omphalomesenteric duct; intestinal obstruction. M. T. SUDLER. Ann. Surg., Phila., 1918, lxvii, 575.

Acute intestinal obstruction due to Jackson's membrane. F. C. PYBUS. Brit. M. J., 1918, i, 258. **[221]**

Spasmodic stenosis and invagination of the intestine. L. FIERAVANTI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 327.

Rupture of intestines by blows upon abdomen. J. S. WRIGHT. Canad. M. Ass. J., 1918, viii, 228. **[221]**

A plea for a legitimate trial of scientific medical methods in chronic intestinal conditions before resorting to a surgical interference. M. D. ORDWAY. Boston M. & S. J., 1918, clxxviii, 606.

Immediate jejunal feeding after gastro-enterostomy. A. F. R. ANDRESEN. Ann. Surg., Phila., 1918, lxvii, 565.

Meckel's diverticulum as a cause of surgical lesion. A. L. MCDONALD. J.-Lancet, 1918, xxxviii, 259. **[222]**

Paralytic ileus in gunshot wounds of the abdomen. R. D. FORBES. Northwest. Med., 1918, xvii, 44.

Ileus following gynecological laparotomies. E. W. PINKHAM. Am J. Obst., N. Y., 1918, lxxvii, 614. **[222]**

Acute gangrenous perforated diverticulitis of the cæcum. A. V. MOSCHCOWITZ. Ann. Surg., Phila., 1918, lxvii, 624.

Roentgen examination of the appendix. M. J. HUBENY. Med. Clin. N. Am., 1918, i, 1445.

The interrelation of appendicitis, cholecystitis, and pancreatitis. E. LAPLACE. Penn. M. J., 1918, xxi, 518. **[222]**

Some points in the treatment of appendicitis. J. AEBLY. Ellingwood's Therap., 1918, xxi, 165.

Preventive appendicectomy. E. POTHERAT. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 273.

Developmental reconstruction of the colon. J. W. DRAPER. Ann. Surg., Phila., 1918, lxvii, 567.

Diverticulitis of the sigmoid. H. C. KRAFFT. Rev. méd. de la Suisse Rom., 1918, xxxviii, 325.

Adenomyoma of the rectum. F. C. YEOMANS. Med. Fortnightly, 1918, l, 111.

Enucleation of rectal cancers by the coccygoperineal route. DESMARET. Presse méd., Par., 1918, xxvi, 180. **[223]**

Melanosarcoma of the rectum, with the report of a case. J. W. CHURCHMAN. Am. J. M. Sc., 1918, clv, 639.

War wounds of the rectum. P. MOCQUOT and B. FEY. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 259.

The ambulant treatment of rectal diseases. H. B. ADAMS. Hahneman. Month., 1918, liii, 206.

Neo-proctology; a glimpse into the future. J. M. LYNCH. Med. Fortnightly, 1918, l, 112.

Fistula in ano; why is operative interference so often ineffectual? F. S. EDWARDS. Lancet, Lond., 1918, cxciv, 673. **[224]**

Accidents and complications of fistula operations. C. J. DRUECK. Interst. M. J., 1918, xxv, 369.

The principles underlying the clamp and cautery operation for internal hæmorrhoids. W. O. HERMANCE. Interst. M. J., 1918, xxv, 403.

Treatment of external hæmorrhoids, anal pruritus, and anal eczema. W. T. MARRS. Med. Summary, 1918, xl, 73.

Fatal result following injection treatment of hæmorrhoids. H. J. SPENCER. Med. Press, 1918, cv, 390.

Liver, Pancreas, and Spleen

Primary cancer of the liver. G. KAWAAI. Sei-i-Kwai, Tokyo, 1918, xxxvii, No. 435.

Abscess of the liver discharging through the bronchi. N. W. GREEN. Ann. Surg., Phila., 1918, lxvii, 631.

The surgical treatment of the cirrhoses of the liver and their complications. W. J. Mayo. Tr. Am. Surg. Ass., Cincinnati, 1918, June. **[224]**

Hepatitis; a constant accompaniment of cholecystitis. E. A. GRAHAM. Surg., Gynec. & Obst., 1918, xxvi, 521.

Contribution to the traumatology of the liver. E. AIEVOLI. Riforma med., Napoli, 1918, xxxiv, 222.

The prognosis of gall-bladder infections. J. H. GIBBON. Am. J. M. Sc., 1918, clv, 664.

The medical aspects of gall-bladder disease. C. L. ESHLEMEN. N. Orl. M. & S. J., 1918, lxx, 823.

The gastro-intestinal aspects of gall-bladder disease. S. K. SIMON. N. Orl. M. & S. J., 1918, lxx, 827.

Surgical aspects of gall-bladder disease. J. M. BATCHELOR. N. Orl. M. & S. J., 1918, lxx, 831.

Cholecystectomy; a useful technique. F. N. G. STARR. Canad. M. Ass. J., 1918, viii, 391.

Examination of gall-stones by roentgen rays. I. F. FISCHER. Nord. med. Ark., Stockholm, 1917, i, Kirurgi, No. 12. **[225]**

Gall-stones. S. WEISS. N. Y. M. J., 1918, cvii, 932, 980.

Injury to the common bile-duct. W. A. DOWNES. Ann. Surg., Phila., 1918, lxvii, 619.

The recurrence of symptoms following operations on the biliary tract. E. S. JUDD. Ann. Surg., Phila., 1918, lxvii, 473. **[226]**

Recurrence of biliary obstruction by gall-stone after removal by operation; acute pancreatitis; death. J. A. C. MACEWEN. Brit. M. J., 1918, i, 563.

Remarks on 240 cases of biliary lithiasis. A. ALTHABE and E. NICHOLSON. Semana méd., Buenos Aires, 1918, xxv, 393.

The principal operative indications in biliary lithiasis. L. LOSIO. Clin. chir., Milano, 1917, xxvi, 1.

Cholecystectomy in biliary lithiasis; 100 cases. J. B. ABALOS. Rev. méd. d. Rosario, 1918, viii, 1.

Pancreatic cysts. W. F. HAMILTON. Canad. M. Ass. J., 1918, viii, 385.

Pancreatic infantilism. R. A. BULLRICH. Rev. Asoc. méd. argent., Buenos Aires, 1918, xxviii, 303.

Experimental study of function in regard to pancreatic surgery. N. DE DOMINICIS. Riforma med., Napoli, 1918, xxxiv, 395.

Absence of the spleen. F. G. ROSE. Brit. M. J., 1918, i, 591.

Splenectomy for necrotic spleen after gunshot. I. SCALONE. Policlin., Roma, 1918, xxv, sez. prat., 538. [226]

The effect of splenectomy on the normal individual and in certain pathological conditions. J. M. HITZROT. Ann. Surg., Phila., 1918, lxvii, 540.

Radium treatment of leukæmia. C. A. ELLIOTT. Med. Clin. N. Am., 1918, i, 1261. [226]

Familial splenomegaly; a clinical study. C. DE LANGE and J. C. SCHIPPERS. Am. J. Dis. Child., 1918, xv, 249. [227]

Miscellaneous

The differential diagnosis of affections of the right upper quadrant. C. G. HEYD. A. J. M. Sc., 1918, clv, 703. [227]

Lesions of the right upper quadrant of the abdomen; differential diagnosis. M. M. PORTIS. Med. Clin. N. Am., 1918, i, 1297.

Reflex gastric disturbance and epigastric pain. J. C. FRIEDMEN. Med. Clin. N. Am., 1918, i, 1331.

A review of 100 consecutive cases of acute diseases of the appendix, gall-bladder, duodenal and gastric ulcers which have come to operation. F. V. HUSSEY. Rhode Island M. J., 1918, xi, 75. [228]

Forty-eight observations on penetrating war wounds of the abdomen. FAURE. Bull. et. mém. Soc. de chir. de Par., 1918, xliv, 656.

The choice of incision in laparotomies for penetrating abdominal wounds. LESTRADE and RICHOUX. Presse méd., Par., 1918, xxv, Supp. 319.

Abdominal operations at an advanced operating center. C. F. M. SAINT. Brit. M. J., 1918, i, 473. [228]

Secondary operations in the abdomen. G. W. PRESSLY. Charlotte M. J., 1918, lxxvii, 194.

The selections of abdominal cases for operation. O. RICHARDS. Brit. M. J., 1918, i, 471. [229]

Same developments in abdominal surgery. F. LACE. Bristol Med.-Chir. J., 1918, xxxvi, 1.

Problems in abdominal surgery. T. J. WATKINS. Surg., Gynec. & Obst., 1918, xxvi, 543.

SURGERY OF THE EXTREMITIES

Diseases of Bones, Joints, Muscles, Tendons—General Conditions Commonly Found in the Extremities

Differential diagnosis of bone tumors. F. H. BAETJER. Am. J. Roentgenol., 1918, v, 260.

Bone growth and bone repair. A. KEITH. Brit. J. Surg., 1918, v, 685.

A case of osteosarcoma of the leg. M. L. KAMATH and B. S. BALIGA. Madras M. J., 1918, i, 79.

Operative treatment of interosseous callus of the forearm. E. JOUON. Rev. d'orthop., Par., 1918, vi, 167.

Further observation on a transposed metatarsal bone. W. L. BROWN and C. P. BROWN. J. Am. M. Ass., 1918, lxx, 1353.

Case of cyst of the femur. J. A. GANNON. Wash. M. Ann., 1918, xvii, 193.

Some troublesome fractures. W. H. FOX. J. Iowa St. M. Soc., 1918, viii, 186.

Bursæ. G. EARL. Minnesota Med., 1918, i, 131. [230]

Scapular osteomyelitis. E. KIRMISSON. Rev. gén. de clin. et de thérap., Par., 1918, xxxii, 132. [230]

Ascending osteomyelitis in amputation stumps with particular reference to the thigh. A. MARCHAND. N. Y. M. J., 1918, cvii, 985.

Report of case of osteitis fibrosa cysticus, involving shaft of right femur and right tibia. R. L. RAMEY. Texas St. J. Med., 1918, xiv, 16. [231]

Elephantiasis; report of a case. R. E. WOBUS and E. L. OPIE. J. Am. M. Ass., 1918, lxx, 987. [231]

A plea for conservation of fingers. E. W. MAECHTLE. Wisconsin M. J., 1918, xvi, 465.

Case of hæmophilia with effusion into knee-joints. P. B. ROTH. Proc. Roy. Soc. Med., 1918, xi, Sect. Dis. Child., 29.

Wounds of the knee-joint. K. EMERSON. Am. J. Orthop. Surg., 1918, xvi, 311.

Internal derangements of the knee-joint. H. BRAMWELL. Brit. M. J., 1918, i, 589.

Immediate active mobilization as a general method of articular lesions. C. WILLEMS. Arch. méd. belges, 1918, lxxi, 225. [231]

Osteo-arthritis from focal infection. W. J. MERRILL. Ann. Surg., Phila., 1918, lxvii, 613.

Treatment of long-standing suppurations in arthritis and osteomyelitis. E. Z. HOLT. J. M. Soc. N. J., 1918, xv, 149.

Essential coxa vara and juvenile deforming arthritis. R. FROELICH. Rev. d'orthop., Par., 1918, vi, 107.

Suppurative arthritis treated by arthrotomy and active mobilization. A. DEPAGE and R. DEBREZ. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 252.

Rheumatic sepsis. U. BACCARANI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 11.

Fractures and Dislocations

Fracture of internal condyle of humerus by muscular action. G. LAWRENCE. Brit. M. J., 1918, i, 509.

The Thomas splint in the treatment of upper limb fractures. P. DEFOSSES and C. ROBERT. Presse méd., Par., 1918, xxv, 241.

Traumatic luxation of the sacro-iliac symphysis without fracture of the pelvis. J. A. SIMPSON. Ann. Surg., Phila., 1918, lxvii, 348. [232]

Gunshot fractures of the long bones of the extremities. H. FROST. Mil. Surgeon, 1918, xlii, 505.

Fractures of the femur. J. McH. DEAN. J. Missouri St. M. Ass., 1918, xv, 153.

Fractures of the femoral neck; a plea for optimism in the treatment. S. J. HUNKIN. Am. J. Orthop. Surg., 1918, xvi, 291.

Mobilization of the knee-joint in suspension-traction treatment of fracture of the femoral shaft. G. A. MOORE. Boston M. & S. J., 1918, clxxviii, 736.

Prognosis of gunshot fractures of the thigh. COUTEAUD. Bull. Acad. de méd., Par., 1918, lxxxix, 352. [232]

Patellar fracture treated by free graft. CARDENAL. Rev. de med. y cirug. práct., Madrid, 1918, cxix, 175.

Fracture of the external tuberosity of the tibia with genu valgum. P. MAUCLAIRE. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 272.

Fracture of the great toe sesamoid bones. T. G. ORR. Ann. Surg., Phila., 1918, lxvii, 609.

Fracture of sesamoid bones. J. HALL-EDWARDS. Arch. Radiol. & Electrotherap., 1918, xxii, 381. [232]

Treatment of fractures. J. S. WIGHT. Am. J Surg., 1918, xxxii, 119.

The treatment of war fractures. H. ROUVILLOIS and GUILLAUME-LOUIS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 516. [232]

Primary suture for complicated fractures. G. PICOT and P. DUVAL. Med. Bull., Par., 1918, i, 395.

Treatment of compound fractures. D. EVE. Atlanta J.-Rec. Med., 1918, lxiv, 368.

Extension forceps for fractures. F. FOREL. Rev. méd de la Suisse Rom., 1918, xxxviii, 321.

The influence of hæmatoma in the recovery of fractures. G. GAZZOTTI. Policlin., Roma, 1918, xxv, sez. chir., 129.

Metatarsal-phalangeal luxation. LEDOUX-LEBARD and TAVENEAU. J. de radiol., Par., 1918, iii, 36.

A rare case of partial achondroplasia in the adult. C. GUARINI. Riforma med., Napoli, 1918, xxxiv, 346.

Incomplete outward dislocation of the knee. R. S. FERGUSON. J. Am. M. Ass., 1918, lxx, 1213. [233]

Luxation of head of fibula due to large tibial callosity. ACHARD. Presse méd., Par., 1918, xxv, Supp., 268.

Surgery of the Bones, Joints, Etc.

Observations on the operative treatment of fracture. C. D. HUNTER. Northwest Med., 1918, xvii, 134.

Treatment of complicated thigh fractures by the Gassette apparatus. G. HOUZEL. Rev. de chir., Par., 1917, liii, 473.

The peroneal tendon as a transplant. M. S. HENDERSON. J. Am. M. Ass., 1918, lxx, 1456.

The conservative surgery of the hand as illustrated by a case of tendon grafting. A. W. MAYO-ROBSON. Brit. M. J., 1918, i, 257. [233]

Plaster continuous extension. H. MAYET. Progrès méd., Par., 1918, p. 146.

An operation which, in selected cases of infantile paralysis of long standing, causes return of power in the paralyzed muscles; report of cases. C. RIELY. Am. J. Orthop. Surg., 1918, xvi, 300.

Treatment of femur shortening. PUTTI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 303.

Correction of lateral angulations in fractures of the thigh and limbs. C. WILLEMS and N. GOORMAGHTIGH. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 220.

Purulent arthritis treated by simple active arthrotomy, followed by immediate active mobilization. C. WILLEMS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 568.

Osteosynthesis. TANTON. Presse méd., Par., 1918, xxv, Supp. 319.

Primary and delayed primary suture in the treatment of war fractures. W. S. BAER. J. Am. M. Ass., 1918, lxx, 1530.

Interilio-abdominal amputation; a description of a new method, with report of three cases. W. W. BABCOCK. Surg., Gynec. & Obst., 1918, xxvi, 554. [233]

The end-results of arthrotomy of the knee. A. MOUCHET and PAMART. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 768. [234]

Treatment of septic arthritis. R. B. COFIELD. Ohio St. M. J., 1918, xiv, 149. [234]

A two-stage operation for tendon suture in the hand, and description of a simple stitch. J. E. FULD. N. Y. M. J., cvii, 833.

Treatment of pseudarthosis by circling and ligating with wire. E. ESTOR. Bull. Acad. de méd., Par., 1918, lxxix, 370.

General technique of primary resection in the treatment of complicated articular wounds. R. LERICHE. Progrès méd., Par., 1918, p. 149.

Wobbly arm after resection. SOULIGOUX. Bull. et mém. Soc. de chir., Par., 1918, xliv, 259.

New method of section or resection of the superior extremity of the tibia. F. MARGARIT. Gac. méd. catal., Barcelona, 1918, lii, 44.

Arthroplasty of the hip. L. TAVERNIER. Rev. d'orthop., Par., 1918, vi, 179.

Arthroplasty of the hip-joint; Murphy method; report of four cases. J. M. BURLEW. Calif. St. J. Med., 1918, xvi, 237.

Report on arthroplastics of ankylosis consecutive to wounds. PUTTI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 303.

Concerning osteoplastic disarticulations. G. ZORRAQUIN. Rev. Asoc. méd. argent., Buenos Aires, 1917, xxvii, 1030.

Remarks on bone-grafting. L. IMBERT. Presse méd., Par., 1918, xxv, 233.

Bone tibial grafts. P. CHUTRO. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 570.

Kineplastic amputations. V. GAUDIANI. Ann. Surg., Phila., 1918, lxvii, 414. [235]

Surgical procedure in amputations of badly traumatized limbs. G. ONANO. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 105.

Bone transplants. M. G. STURGIS. Northwest Med., 1918, xvii, 137.

Transplant on the hand after operation for carcinoma. E. M. FOOTE. Ann. Surg., Phila., 1918, lxvii, 629.

Tendon transplantation to stabilize the hip-joint. R. M. YERGASON. Am. J. Orthop. Surg., 1918, xvi, 323.

Orthopedics in General

Cinematic prosthetics of the upper limbs. G. CORRADO. Riforma med., Napoli, 1918, xxxiv, 413.

The most effective treatment of lower extremity deformities due to anterior poliomyelitis. H. F. CONNALLY. Texas St. J. Med., 1918, xiv, 20.

Operative measures in infantile paralysis. W. C. CAMPBELL. Texas M. J., 1918, xxxiii, 396. [235]

The orthopedic treatment of infantile paralysis. A. T. LEGG. J. Maine M. Ass., 1918, viii, 275.

Prevention and treatment of localized muscular contractures. A. GOTTLIEB. Calif. St. J. Med., 1918, xvi, 254. [235]

The employment of traction in certain passive and resisted movements of joints. E. F. CYRIAX. Med. Press, 1918, cv, 370.

Functional inability through war wounds. R. FALCONE. Riforma med., Napoli, 1918, xxxiv, 122.

The problem of the disabled. R. JONES. Am. J. Orthop. Surg., 1918, xvi, 273.

Method and organization of re-education for war cripples in Germany. D. C. MCMURTRIE. Med. Rec., 1918, xciii, 881.

Arch defects of the human foot. E. H. SMITH. Calif. St. J. Med., 1918, xvi, 256. [235]

Weak and painful feet. M. K. WALLIN. Woman's M. J., 1918, xxviii, 97.

The treatment of flat-foot. R. NEWMAN. N. Y. M. J., 1918, cvii, 978.

The treatment of flat-feet. L. MAYER. Med. Rec., 1918, xciii, 811. [235]

Painful foot in children. RIOSALIDO. Arch. Espan. de pediat., Madrid, 1918, ii, 84.

Structural deformities versus functional efficiencies as objects of treatments. H. W. MARSHALL. Boston M. & S. J., 1918, clxxviii, 708.

A case of genu recurvatum with subluxation of the tibia of probably congenital origin. NOVÉ-JOSSERAND. Rev. d'orthop., Par., 1918, vi, 101.

SURGERY OF THE SPINAL COLUMN AND CORD

Fracture of the cervical spine producing Brown-Sequard syndrome. D. STETTEN. Ann. Surg., Phila.. 1918, lxvii, 636.

Operative treatment of fracture of the spine uncomplicated by cord injury. E. G. BRACKETT, W. J. MIXTER, and J. C. WILSON. Ann. Surg., Phila., 1918, lxvii, 513.

Contracture of the bladder due to spinal injury. M. W. WARE. Ann. Surg., Phila., 1918, lxvii, 533.

Spinal injuries of war. COUTEAUD. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 728. [236]

Lesion of the third lumbar root by gunshot. G. B. MODENA. Riv. di patol. nerv. e ment., Firenze, 1918, xxiii, 16.

Sacral tabes with the clinical picture of a lesion of the conus medullaris; report of case. G. B. HASSIN and E. P. CARROLL. J. Am. M. Ass., 1918, lxx, 755. [236]

Laminectomy for gunshot wound; with a record of three successful cases. D. M. HUGHES. Brit. M. J., 1918, i, 280. [236]

A case of spina bifida operated upon within nine hours of birth. F. IRUEGAS. Siglo méd., Madrid, 1918, lxv, 315.

Operative treatment of spinal caries. K. KUROIWA. Sei-Kwai, Tokyo, 1918, xxxvii, No. 434.

War traumatisms of the spinal column. G. D. ABUNDA. Riv. ital. di neuropat., Catania, 1918, xi, 1.

Spondyitis chronica ankylopoietica. W. ALLAN and J. W. SQUIRES. South. M. J., 1918, xi, 373.

Case of hæmorrhage glioma of the spinal medulla. G. ARTON. Riv. di patol., nerv. e ment., Firenze, 1918, xxiii, 33.

SURGERY OF THE NERVOUS SYSTEM

Surgical treatment of nerve wounds; operative technique and results of 245 cases of suture and 113 liberations. H. DELAGENIÈRE. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 522. [237]

Degeneration and experimental regeneration of peripheric nerves. P. ROJAS. An. d. Inst. mod. de clin. med., Buenos Aires, 1917, ii, 171.

Operative treatment in selected cases of chronic peripheral facial paralysis. W. SHARPE. J. Am. M. Ass., 1918, lxx, 1354.

Complete section of the ulnar nerve and functional result. M. GALLAND. Presse méd., Par., 1918, xxv, 41.

Unrecognized paralysis of the ulnar nerve. C. MONCANY. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 551.

Enucleation of a fibroma of the ulnar nerve with perfect preservation of the nerve trunk. G. VERGA. Policlin., Roma, 1918, xxv, sez. prat., 523.

Note on the study of radical paralysis. P. CHARPY. J. de radiol., Par., 1918, iii, 9.

Gunshot wound of the posterior cord of the brachia plexus. J. K. YOUNG. Boston M. & S. J., 1918, clxxviii, 501. [238]

The diagnosis of disseminated sclerosis. A. G. MORPHY. Canad. M. Ass J, 1918, viii, 401.

Gunshot lesions of the cauda equina. G. GUILLAIN and J. A. BARRÈ. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 272.

A surgeon's impression of trigeminal neuralgia; 302 cases. C. H. FRAZIER. J. Am. M. Ass., 1918, lxx, 1345.

Nerve stretching in trophic processes. BLANC Y FORTACIN. Rev. de med. y. cirug. práct., Madrid, 1918, cxix, 65.

Nerve wounds of war. LONG. Schweiz. Arch. f. Neurol. u. Psychiat., Zurich, 1918, ii, 130.

MISCELLANEOUS

Clinical Entities—Tumors, Ulcers, Abscesses, Etc.

The cancer question. A. C. GEYSER. Interst. M. J., 1918, xxv, 421.

When a cancer is not a cancer. E. V. DE PEW. N. Y. M. J., 1918, cvii, 832.

Medical versus surgical treatment of cancer. F. DUGDALE. Charlotte M. J., 1918, lxxvii, 211.

The treatment of cancer. E. RIBAS Y RIBAS. Rev. de cien. méd., Barcelona, 1918, xliv, 1, 41, 81. [238]

A plea for the use of potassium nitrate in the treatment of cancer. E. P. ROBINSON. Med. Rec., 1918, xciii, 764.

The present status of our knowledge of carcinoma. J. E. ELSE. Med. Sentinel, 1918, xxvi, 207.

Treatment of skeletal myeloid sarcoma. PUTTI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 272.

Tumors consecutive to injection of camphorated oil in vaseline. O. JACOB and FAURE-FREMIET. Rev. de chir., Par., 1917, liii, 221.

Congenital tumors of the sacrococcygeal region. A. M. ARQUELLADA. Pediat. Espan., Madrid, 1918, vii, 1.

New operative treatment of carbuncles and boils. K. J. DIKSHIT. Indian M. Gaz., 1918, liii, 139.

Botryomycotic gunshot wound. P. MASSON. Lyon chirurg., 1918, xv, 230. [239]

Treatment of war wounds by urotropine. D. DE FRENELLE and PAYCHÈRE. Presse méd., Par., 1918, xxv, Supp. 317.

Shock in war surgery. E. QUÉNU. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 496.

Shock in the surgery of the war. LACOSTE. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 494.

A diagnostic element of the different states of shock in the wounded. MOULINIER. J. de méd. de Bourdeaux, 1918, lxxxix, 102.

The phenomena of shock. P. DESCOMPS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 245.

Intravenous injection in wound shock. W. M. BAYLISS. Brit. M. J., 1918, i, 553. **[239]**

Intravenous injection of Locke's serum with gum arabic in the treatment of severe hæmorrhagic hypotension and shock. H. DELAUNAY. Lyon chirurg., 1918, xv, 211. **[240]**

Case considered as toxæmic shock. VILLECHAISE. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 662.

Surgical shock and some related problems. J. E. SWEET. Am. J. M. Sc., 1918, clv, 625.

Traumatic shock. W. T. PORTER. Boston M. & S. J., 1918, clxxviii, 657.

Traumatic shock in the untransportable severely wounded. SOUBEYRAN. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 672.

Shock. NIMIER. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 653.

A study of the low blood-pressures associated with anaphylactic and peptone shock and experimental fat embolism, with special reference to surgical shock. J. P. SIMONDS. J. Exp. Med., 1918, xxvii, 539.

Elephantiasis; report of a case in Minnesota. A. N. BESSESEN. Minnesota Med., 1918, i, 185.

Some phases of endocrinology. W. V. P. GARRETSON. N. Y. M. J., 1918, cvii, 866.

The endocrine function of the ovary and the mammary secretion. F. A. C. BAZAM. Semana méd., Buenos Aires, 1918, xxv, 514.

The physiology of the corpus luteum. E. T. HERMANN. Minnesota Med., 1918, i, 181.

The relation of the glands of internal secretion to surgery. J. B. HAEBERLIN. Illinois M. J., xxxiii, 262.

A contribution to the study of dosage in radium therapy. J. C. MOTTRAM and S. RUSS. Arch. Radiol. & Electrotherap., 1918. xxii, 309. **[241]**

New technique for radium therapy in rhinolaryngology. BARAJAS y de VILCHEZ. Med. Ibera, Madrid, 1918, iii, 61.

Polycystic vaselinoma. J. D AZNA. Prog. de la Clin., Madrid, 1918, vi, 173.

Morphœa or scleroderma. W. B. COLEY. Ann. Surg., Phila., 1918, lxvii. 632.

The stellar crystals of ammonio-magnesio-phosphate in the urine. E. CAVAZZANI. Riforma med., Napoli, 1918, xxxiv, 387.

Flexiform neuroma and Recklinghausen's syndrome. P. FREDET. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 271.

Sulphoconjugation as a test of liver function. M. KAHN. Am. J. M. Sc., 1918, clv, 668.

The effect of ultraviolet rays on the skin and eyes. F. A. JOHNS. Brit. M. J., 1918, i, 535.

Acidosis and surgery. F. JEUNET. Presse méd., Par., 1918, xxv, 246.

Absolutely necessary microscopic diagnosis. W. C. MAC CARTY. Minnesota Med., 1918, i, 178.

Organic basis of neurasthenia and surgical cure. H. W. RIGGS. Northwest Med., 1918, xvii, 131.

One thousand operations executed at the Vargas Hospital, 1914-1918. L. RAZZETTI. Gac. méd. de Caracas, 1918, xxv, 89.

Intramuscular injections of mercury cyanide in infants. J. C. NAVARRO. Rev. Asoc. méd. argent., Buenos Aires, 1918, xxviii, 360.

The pathogenesis of diabetes insipidus. C. MORESCHI. Policlin., Roma, 1918, sez. med., 99.

The advantage of radiologic examination of fistulous tracts after bismuth injection. L. MOREAU. Arch. d'électric. méd., Par., 1918, xxvi, 155.

The pathology of the skin lesions produced by mustard gas. A. S. WARTHIN and C. V. WELLER. J. Lab. &. Clin. Med., 1918, iii, 447.

Paraffin in the treatment of burns as developed in the present war. W. H. STILES. Pacific Coast J. Homœop., 1918, xxix, 242.

Heliotherapy of tuberculosis. S. A. DE VEVEY. Bull. gén. de thérap., Par., 1918, clxix, 1012.

The unconscious. A. STERN. N. Y. M. J., 1918, cvii, 869.

Sera, Vaccines, and Ferments

The Wassermann reaction; its use and abuse. H. W. BAYLY. Lancet, Lond., 1918, cxciv, 632.

Some practical considerations of the Wassermann reaction, based upon theory, bacteriological, and pathological conditions of syphilis. F. R. MENNE. Med. Sentinel, 1918, xxvi, 199.

Some important principles which determine the reliability of the Wassermann reaction. J. MCINTOSH. Lancet, Lond., 1918, cxciv, 630.

The Wassermann reaction with diabetic sera. A. I. VAN SAUN. J. Med. Research, 1917, xxxvii, 205. **[242]**

Four years' further experience of autogenous oral streptococcal vaccines in the treatment of 17 cases of sprue. L. ROGERS. Indian M. Gaz., 1918, liii, 121.

Blood

Relation between the platelet count of human blood and its vasoconstrictor action after clotting. K. HIROSE. Arch. Int. Med., 1918, xxi, 604.

Experiments on the vasoconstrictor action of blood serum. T. C. JANEWAY, H. B. RICHARDSON and E. A. PARK. Arch. Int. Med., 1918, xxi, 565.

Migrating projectile in the arterial system. MAZET. Presse méd., Par., 1918, xxv, Supp. 317.

The organization of blood-clots after auto-, homo-, and heterotransplantation. L. LOEB. J. Med. Research, 1918, xxxvii, 353. **[242]**

Diagnosis and classification of the hæmopathias. G. PITTALUGA. Gac. méd. catal., Barcelona, 1918, lii, 233.

Finding of the staphylococcus albus in hæmocultures. G. A. PARI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 273.

The occurrence of mitochondria in the red blood corpuscles during experimental anæmias. C. O. SAPPINGTON. Arch. Int. Med., 1918, xxi, 695.

Pernicious anæmia, with special reference to its surgical management. N. M. PERCY. Canda. J. M. & S., 1918, xliii, 120.

The total blood volume in pernicious anæmia. E. LINDEMAN. J. Am. M. Ass., 1918, lxx, 1292.

The surgical treatment of the anæmias. F. C. BUCHTEL. Colorado Med., 1918, xv, 114.

The results of pernicious anæmia. A. BLOOMFIELD. Bull. Johns Hopkins Hosp, 1918, xxix, 101.

The part played by hæmorrhage in traumatic shock. P. SANTY. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 207.

Secondary venous hæmorrhage consecutive to war wounds. G. RAZZIBONI. Riforma med., Napoli, 1918, xxxiv, 302.

Suggestions for the prevention of postoperative thrombosis and embolism. F. MCCANN. Brit. M. J., 1918, i, 277. **[243]**

Blood transfusions. G. ROSENTHAL. Bull. gén. de thérap., Par., 1918, clxix, 860.

Transfusion of citrated blood. THEVÉNARD. Presse méd., Par., 1918, xxv, 237.

Transfusion of citrated venous blood by the Jeanbrau method; 60 cases. I. MURARD. Lyon chirurg., 1918, xv, 147.

Two fortunate cases of blood transfusion. LACOSTE and PICQUE. Presse méd., Par., 1918, xxv, Supp. 318.

The effect of continued transfusions in pernicious anæmia on the blood picture. M. D. LEVY. South Texas M. Rec., 1918, xii, 14.

Blood transfusion. J. GUYOT. J. de méd., Bordeaux, 1918, lxxxix, 119.

An apparatus and simple technique for blood transfusion. J. FIEVEZ. Progrès méd., Par., 1918, p. 150.

Formula for serum for blood transfusion. D. DEFRENELLE and PAYCHÈRE. Presse méd., Par., 1918, xxv, Supp. 317.

Further observations on the hæmagglutinin reaction; with special reference to the operation of blood transfusion and to nephritis. C. J. BOND. Brit. M. J., 1918, i, 253.

The hæmatological indications of immediate transfusion in the first hours after a wound. A. DEPAGE and P. GOVAERTS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 247.

Blood and Lymph Vessels

Oscillometry in the diagnosis of aneurisms and encysted hæmatoma. GUYOT and FABRE. Gazz. hebd. d. sc. méd., Bordeaux, 1918, xxxix, 74.

A case of popliteal aneurism. BLANC Y FORTACIN. Med. Ibera, Madrid, 1918, iii, 158.

The danger of early operation in jugulocarotid aneurisms. MARQUIS. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 458.

Aneurismal dilatation of the femoral vein immediately after opening of the saphenous vein simulating a crural hernia. C. MARCHESI. Policlin., Roma, 1918, xxv, sez. prat., 277.

Wounds of the large vessels of the neck. P. MOCQUOT. Rev. de chir., Par., 1917, liii, 441.

Some considerations upon vascular wounds with reference to a case of arterial intubation. GATELLIER. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 437. **[244]**

Experiments outlining the limitations of operation on the abdominal aorta. C. GOODMAN. J. Exp. Med., 1918, xxvii, 569.

Poisons

Notes on gas gangrene. COSTANTINI and VIGOT. Bull. méd., Par., 1918, xxxii, 179.

The bacterial flora of war wounds; influence of treatment. K. GOADBY. Brit. M. J., 1918, i, 581.

Predisposing factors in the etiology of tuberculosis, theoretically considered; a plan to reduce greatly the incidence of tuberculosis. O. H. BROWN. Med. & Surg., 1918, ii, 434.

A case of syphilitic reinfection. P. N. PANTON and A. M. SIMPSON. Brit. M. J., 1918, i, 535.

The rôle of syphilis in surgery. G. GELLHORN. South. M. J., 1918, xi, 369.

Toxicity of salvarsan. H. ULRICH. N. Eng. M. Gaz., 1918, liii, 251.

Notes on vibrion septique. M. ROBERTSON. Brit. M. J., 1918, i, 583.

Actinomycosis and botryomycosis in the Tsoul country. M. TUSSAU. Lyon chirurg., 1918, xv, 241.

The hospital antidotal cabinet, with a chart indicating treatment of poisoning. J. ROSENBLOOM. Interst. M. J., 1918, xxv, 385.

Roentgenology

The part X-ray plays in the treatment of cancer. R. B. ARMSTRONG. J.-Lancet, 1918, xxxviii, 190. **[244]**

Adjuncts to roentgenotherapy in the treatment of malignant disease. G. E. PFAHLER. Am. J. Roentgenol., 1918, v, 249.

Roentgentherapy of fibroma. J. GUARDADO. Rev. Asoc. méd. argent., Buenos Aires, 1918, xxviii, 337.

X-ray work in a base hospital in France; a few observations of a practical nature. B. H. S. AYLWARD. J. Roy. Army M. Corps, 1918, xxx, 493.

The training of the student of medicine; pathology and the medical student. H. R. DEAN. Edinb. M. J., 1918, xx, 307.

Electrical department, military hospital, Tidworth. F. GOWER-BERGIN. Arch. Radiol. & Electrotherap., 1918, xxii, 376.

Observations on roentgenoscopy at the front. R. DESPLATS. Am. J. Roentgenol., 1918, v, 222.

Introduction to a demonstration of a simple means of obtaining "static modalities" from a coil. G. B. BATTEN. J. Roentg. Soc., Lond., 1918, xiv, 56.

A consideration of the various methods now available for heating the filament of a Coolidge-tube. F. HERNAMAN-JOHNSON. Arch. Radiol. & Electrotherap., 1918, xxii, 365.

Demonstration of an apparatus for making fluororoentgenography. A. G. DE WEAL. J. Missouri St. M. Ass., 1918, xv, 166.

A new "radiator" type of hot-cathode X-ray tube. W. D. COOLIDGE. J. Roentg. Soc., Lond., 1918, xiv, 38.

A mobile Snook apparatus; a transformer for heating the filament of a Coolidge tube. E. E. BURNSIDE. J. Roentg. Soc., Lond., 1918, xiv, 63.

A portable roentgen ray generating unit. W. D. COOLIDGE and C. N. MOORE. J. Roentg. Soc., Lond., 1918, xiv, 43.

Radiochirurgical collaboration. DUHEM. Arch. d'electric. méd., Par., 1918, xxvi, 198.

A brief summary of the indications for roentgenotherapy. J. T. CASE. J. Mich. St. M. Soc., 1918, xvii, 133. **[244]**

Sodium and potassium iodides in roentgenography. D. F. CAMERON and C. C. GRANDY. J. Am. M. Ass., 1918, lxx, 1516.

Practical radiography for the orthodontist. E. H. SKINNER. Internat. J. Orthodontia, 1918, vi, 251.

The use of the opaque ureteral catheter to localize missiles in the region of the kidney and ureter. A. FULLERTON. Arch. Radiol. & Electrotherap., 1918, xxii, 371. **[245]**

The value of X-ray in the diagnosis of abdominal disease. F. HERNAMAN-JOHNSON. Med. Press, 1918, cv, 409.

A technique for the lateral view of the upper end of the femur. R. W. A. SALMOND. Arch. Radiol. & Electrotherap. 1918, xxii, 297.

Arteriosclerosis demonstrated by X-ray. I. D. MORGAN. J. de radiol., Par., 1918, iii, 37.

Two rare cases of ligamentary ossification diagnosed radiologically. C. GUARINI. Riforma med., Napoli, 1918, xxxiv, 208.

Localization of foreign bodies; the standard methods approved by the Surgeon General's Office, U. S. Army. J. S. SHEARER. Am. J. Roentgenol., 1918, v, 229. **[245]**

Roentgenology in the American Army. F. WHEATLEY, JR. Boston M. & S. J., 1918, clxxviii, 727.

Hospital, Medicolegal, and Medical Education

Hospitals and vocational training. R. P. BORDEN. Boston M. & S. J., 1918, clxxviii, 634.

The system of training and the nurse. C. A. AIKENS. Trained Nurse & Hosp. Rev., 1918, lx, 261.

The training of the student of medicine; on the teaching of pathological anatomy, with special reference to clinical medicine. I. MACKENZIE. Edinb. M. J., 1918, xx, 318, 329.

The training of the student of medicine; the teaching of pathology. L. SMITH. Edinb. M. J., 1918, xx, 334.

The training of the student of medicine. RITCHIE. Edinb. M. J., 1918, xx, 339.

The demand for and training of laboratory technicians. J. A. KOLMER. J. Lab. & Clin. Med., 1918, iii, 493.

Regulation of the practice of medicine in California since 1914. H. E. ALDERSON. Calif. St. J. Med., 1918, xvi, 232.

North American surgery in 1917. R. FINOCHIETTO. Semana méd., Buenos Aires, 1918, xxv, 201, 230, 292.

Some of Rabelais' ideas of the stomach. D. W. MONTGOMERY. Med. Rec., 1918, xciii, 769.

Opportunities for preventive medical work in the dispensary clinic. A. M. RICHARDSON. Med. Rec., 1918, xciii, 853.

Hospital building in India. R. BRYSON. Indian M. Gaz., 1918, liii, 92.

Henry VIII, a most liberal patron of medicine. H. D. KING. Med. Press, 1918, cv, 391.

MILITARY SURGERY

Gunshot wounds of the abdomen at a casualty clearing station. R. CHARLES. Brit. M. J., 1918, i, 337. **[246]**

Gastrorrhagia from gastric ulceration as effects of toxic war gases. ZAGARRI. Riforma med., Napoli, 1918, xxxiv, 242.

Treatment of gunshot injuries of the spinal cord at asualty clearing stations. H. M. W. GRAY. N. Y. M. J., 1918, cvii, 937.

The army and tuberculosis. P. K. BROWN. Med. & Surg., 1918, ii, 389.

The confusion of so-called war surgery ahd ordinary surgery. D. GIORDANO. Riforma med., Napoli, 1918, 1918, xxxiv, 162.

The general lessons of war surgery. J. FIOLLE. Presse méd., Par., 1918, xxv, Supp., 361.

Primary suture of wounds at the front in France. A. BOWLBY. Brit. M. J., 1918, i, 333. **[247]**

Primary operations in war surgery. A. DEMMLER. Progrès méd., Par., 1918, p. 158.

Experiences in war surgery. V. D. FABIO. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 159.

Front line war surgery. G. MIONI. Clin. chir., Milano, 1917, xxvi, 115.

The carrying of the wounded in trenches. B. GRAVES. J. Roy. Army M. Corps, 1918, xxx, 432.

Observations on military surgery. NEFF and O'MALLEY. Med. Bull., Par., 1918, i, 390.

The reclamation of the wounded soldier. H. N. MAC KECHNIE. Illinois M. J., 1918, xxxiii. 245.

The rehabilitation of disabled soldiers in New Zealand. D. C. MCMURTRIE. N. Y. M. J., 1918, cvii, 986.

Reconstructing crippled soldiers of France. D. C. MC MURTRIE. N. Y. M. J., 1918, cvii, 840.

Examination of enlisted men for tuberculosis. P. GATH. Med. & Surg., 1918, ii, 396.

Ophthalmic examination of drafted men at Camp Jackson. B. CHANCE. Am. J. Ophth., 1918, i, 318.

The physical condition of American men of military age. I. W. BREWER. N. Y. M. J., 1918, cvii, 216. **[248]**

Medical Reserve Corps. W. C. GORGAS. Am. J. Roentgenol., 1918, v, 219.

Wartime nursing problems; report of Public Health Committee, N. Y. Academy Medicine. Med. Rec., 1918, xciii, 898.

Nurses and the war. P. K. BROWN. J. Am. M. Ass., 1918, lxx, 1438.

A few civil war hospitals. C. WOOD. Mil. Surgeon, 1918, xlii, 539.

Advanced surgical posts. R. PICQUÉ. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 613.

Organization and working of surgical posts on ships. DELANGLADE. Rev. de chir. de Par., 1917, liii, 401.

Surgical work at a casualty clearing station. T. H. GOODWIN. South. M. J., 1918, xi, 363.

Report of a base laboratory in Mesopotamia for 1916, with special reference to water-borne diseases. T. K. BONEY, D. G. CROSSMAN, and C. L. BOULENGER. J. Roy. Army M. Corps, 1918, xxx, 409.

A step forward in the use of the army litter. G. B. KENT. J. Indiana St. M. Ass., 1918, xi, 191.

American hospital trains in France. H. CLARKE. Med. Times, 1918, xlvi, 117.

GYNECOLOGY

Uterus

Bloodless repair of the cervix uteri. A. HEINEBERG. Am. J. Obst., N. Y., 1918, lxxvii, 652. **[249]**

Experimental researches on the human and animal uterus. P. POSO. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 159.

Method of abdominal hysterectomy for fibroma with lower pole impacted; excavation method. P. BÉGOUIN. Bull. et mém. Soc. de chir. de Par., 1918, xliv, 295. **[249]**

Treatment of fibroid tumors of the uterus with radium. H. A. KELLY. J. M. Soc. N. J., 1918, xv, 145.

The acetone treatment of uterine cancer. R. E. WOBUS. J. Missouri St. M. Ass., 1918, xv, 116. **[249]**

Carcinoma of the uterus. C. J. TEASS. Western M. Times, 1918, xxxvii, 441.

Specimen from an autopsy eighteen months after Percy cauterization for carcinoma of the uterus. J. A. CORSCADEN. Am. J. Obst., N. Y., 1918, lxxvii, 826.

Abdominal uterine hæmorrhage in young women. A. MCDONALD. Arch. Diagnosis, 1918, x, 361. **[250]**

Clinical remarks upon metritis. E. ARGONZ. Rev. med. d. Rosario, 1918, viii, 97.

The development and the perfection of the interposition operation for prolapse of uterus and bladder. I. S. STONE. Am. J. Obst., N. Y., 1918, lxxvii, 773.

Treatment of cystocele and uterine prolapse during the childbearing period. T. J. WATKINS. Surg., Gynec. & Obst., 1918, xxvi, 570.

A new operation for prolapse of the uterus. E. RIES. Am. J. Obst., N. Y., 1918, lxxvii, 758.

The menopause. J. J. REYCRAFT. Med. Summary, 1918, xl, 75.

The pathological uterus at the menopause. C. R. ROBINS. Med. Press, 1918, cv, 412.

Myomectomy or hysterectomy. V. BONNEY. Brit. M. J., 1918, i, 278.

Advantages of total abdominal hysterectomy, especially in pelvic suppurations. ROCHARD. Bull. Acad. de méd., Par., 1918, lxxxix, 356.

Adnexal and Periuterine Conditions

Two cases of retrovesical hyatid cysts. COVISA. Rev. de med. y cirug. práct., Madrid, 1918, cxix, 176.

Double papillary carcinoma of the ovaries united by inflammatory adhesons. H. GRAD. Am. J. Obst., N. Y., 1918, lxxvii, 840.

Morular ovarian neoplasms; the so-called ovarian dermoid cysts; a brief literary review, including the report of a case. J. B. LUKINS. Am. J. Surg., 1918, xxxii, 114.

The efficacy of oviarectomy in severe hysterism. N. FEDERICI. Riforma med., Napoli, 1918, xxxiv, 30.

Statistical study of 100 cases of pyosalpinx. H. GRAD. Am. J. Obst., N. Y., 1918, lxxvii, 630. **[251]**

External Genitalia

Cysts of the vagina. F. BINDI. Gazz. d. osp. e d. clin., Milano, 1918, xxxix, 387.

Utilization of the anal sphincter in persistent vesicovaginal fistula. A. TURENNE. Rev. argent. de obst. y ginec., Buenos Aires, 1918, ii, 3.

Miscellaneous

The therapeutic influence of X-rays on female pelvic disease. J. PHILLIPS. Arch. Radiol. & Electrotherap., 1918, xxii, 333. **[251]**

A review of certain postulates in pelvic surgery. W. R. DAVIES. Penn. M. J., 1918, xxi, 521.

Perineal hernia. A. V. MOSCHCOWITZ. Surg., Gynec. & Obst., 1918, xxvi, 514.

The relation of the ductless glands to gynecology; physiological and therapeutic. A. H. BIGELOW. Boston M. & S. J., 1918, clxxviii, 715.

Obstetrics; clinical progress in a period of fifteen years. H. G. MYRICK. J. Am. Inst. Homœop., 1918, x, 1269.

OBSTETRICS

Pregnancy and Its Complications

Pathology of pregnancy. P. REED. J. Iowa St. M. Soc., 1918, viii, 168.

Abdominal pregnancy. S. R. ACHARYA. Madras M. J., 1918, i, 34. **[252]**

Diagnosis of unruptured ectopic pregnancy. J. O. POLAK. Long Island M. J., 1918, xii, 121. **[252]**

Two cases of ectopic pregnancy. M. W. HILL. Pacific Coast J. Homœop., 1918, xxix, 227.

Full term ectopic pregnancy with operation eight months later. E. MATHIS. Texas St. J. Med., 1918, xiv, 13.

The cause of tubal pregnancy. W. S. GARDNER. W. Virg. M. J., 1918, xii, 370. **[252]**

Eclampsia. L. D. BOUGHTON. Hahneman. Month., 1918, liii, 211.

Treatment of eclampsia. J. C. EDGAR. J. Am. M. Ass., 1918, lxx, 1205. **[253]**

Multiple cæsarean section. F. N. WARD. Pacific Coast J. Homœop., 1918, xxix, 232.

Cæsarean section for pregnancy complicated with cardiac discompensation. H. ARANOW. Am. J. Obst., N. Y., 1918, lxxvii, 835.

The technique of the cæsarean operation. S. D. CHIAJE. Riforma med., Napoli, 1918, xxxiv, 302.

Indications for cæsarean section. H. L. D. KIRKHAM. South. Texas M. Rec., 1918, xii, 12.

Comparison between pubiotomy and the cæsarean operation in moderate pelvic strictures. MANUECO. Arch. de ginec., obst. y pediat., Barcelona, 1918, xxxi, 30. **[253]**

Spontaneous hysteropexy in repeated cæsarian operation. E. ZARATE. Rev. argent. de obst. y ginec., Buenos Aires, 1918, ii, 20.

Delivery by abdominal section. E. P. DAVIS. Am. J. Obst., N. Y., 1918, lxxvii, 786.

Tubal abortion with cystic degeneration of the ovary on the same side. R. B. JOHNSTON. Brit. M. J., 1918, i, 590.

Abortion and its treatment. A. J. RONGY. N. Y. St. J. Med., 1918, xviii, 196.

Premature separation of the normally implanted placenta. A. H. MORSE. Surg., Gynec. & Obst., 1918, xxvi, 133. **[254]**

The treatment of placenta prævia. A. LAKSHMANASWAMI. Madras M. J., 1918, i, 89.

Antepartum diagnosis. J. O. POLAK. Med. Times, 1918, xlvi, 127.

An interesting Breus mole. I. C. BERRI. Semana méd., Buenos Aires, 1918, xxv, 103. **[254]**

Ignored syphilis in obstetrics. E. A. BOERO. Arch. de ginec., obst. y pediat., Barcelona, 1918, xxxi, 67.

Syphilis and the Wassermann reaction in pregnancy and the puerperal state. H. DIEHL. N. Eng. M. Gaz., 1918, liii, 245.

Interstitial pregnancy; adenomyoma of the rectovaginal septum. A. H. CURTIS. Surg., Gynec. & Obst., 1918, xxvi, 551.

Fibromyoma complicating pregnancy. JUDD. Am. J. Obst., N. Y., 1918, lxxvii, 849.

Uterine fibroid complicated by pregnancy. J. O. POLAK. Am. J. Obst., N. Y., 1918, lxxvii, 837.

Some cases of gravidic pyelonephritis. R. LAPANZE. Caz. hebd. d. sc. méd., Bordeaux, 1918, xxxix, 65.

Gall-bladder disease complicating pregnancy. A. W. WHITE. Am. J. Obst., N. Y., 1918, lxxvii, 821, 850.

The relation of the hypophysis to increased diuresis and to the so-called diabetes insipidus of pregnancy. A. GENTILI. Ann. di ostet. e ginec., Milano, 1917, xli, 173.

A modification of the Ahlfeld method for determining the maturity of the fœtus in utero. H. THOMAS. Surg., Gynec. & Obst., 1918, xxvi, 563.

Management of premature labor and obstetric surgery outside of hospitals. C. W. STEPHENSON. J. Iowa St. M. Soc., 1918, viii, 177.

Urinary infections of pregnancy and the puerperium. F. H. SMITH. Am. J. M. Sc., 1918, clv, 392. **[254]**

Labor and Its Complications

Obstetrical physiology and delivery. F. M. HORSLEY. Virg. M. Month., 1918, xlv, 45.

Old primiparæ; connection between the age and the mode of labor in primiparæ. B. J. KOUWER. Arch. mens. d'obst. et de gynéc., Par., 1917, vi, 207.

Value of early diagnosis in contracted pelvis. D. G. PUENTE. Med. Ibera, Madrid, 1918, iii, 36.

Combined rupture and inversion of the uterus. A. BRINDEAU. Arch. mens. d'obst. et de gynéc., Par., 1917, vi, 195.

Obstetrical anæsthesia. C. B. PALMER. Calif. St. J. Med., 1918, xvi, 175. [255]

Indications and use of drugs in obstetrics. H. W. VINSON. J. Iowa St. M. Soc., 1918, viii, 171.

Painless childbirth. W. F. B. WAKEFIELD. Am. J. Obst., N. Y., 1918, lxxvii, 792.

Natural painless childbirth. R. F. E. AUSTIN. Indian M. Gaz., 1918, liii, 99.

Fœtal death during labor. C. B. REED. Surg., Gynec. & Obst., 1918, xxvi, 545.

Nitrous oxide analgesia in obstetrics. J. C. HOAG. Chicago M. Recorder, 1918, xl, 181.

Obstetric accidents as a cause of gynecological conditions. W. C. KASTEN. J. Iowa St. M. Soc., 1918, viii, 175.

Puerperium and Its Complications

Treatment of puerperal endometritis by permanent drainage. J. INFANTOZZI. Rev. argent. de obst. y ginec, Buenos Aires, 1918, ii, 59. [255]

Pelvic floor repair during the puerperium; report of cases. A. J. RONGY. Am. J. Obst., N. Y., 1918, lxxvii, 832.

Analysis of clinical types of puerperal fever with special reference to prognosis and treatment. B. P. WATSON and W. A. SCOTT. Canad. M. Ass. J., 1918, viii, 321. [256]

Postpartum eclampsia. E. HAUGH. Arch. mens. d'obst. et gynéc., Par., 1917, vi, 224.

Endocarditis and embolia in the puerperium and gynecological affections. A. GRACIA. Med. Ibera, Madrid, 1918, iii, 71.

Miscellaneous

A consideration of some of the anatomical factors concerned in the production of deformed pelves. J. W. WILLIAMS. Am. J. Obst., N. Y., 1918, lxxvii, 714.

A case of retained macerated fœtus. M. L. KAMATH and B. S. BALIGA. Madras M. J., 1918, i, 88.

Chorio-angiopagen. I. AYORA. Surg., Gynec. & Obst., 1918, xxvi, 568.

The hæmorrhagic disease of the newly born. C. H. SEYBERT and W. M. HILLEGAS. Hahneman. Month., 1918, liii, 274.

Summary of symposium on obstetrics. F. M. FULLER. J. Iowa St. M. Soc., 1918, viii, 180.

Obstetric clinic, Kansas City General Hospital. G. C. MOSHER and B. G. HAMILTON. J. Kansas M. Soc., 1918, xviii, 110.

A consideration of the proper management of obstetrical engagement in sparsely settled districts. D. H. SMITH. J. So. Car. M. Ass., 1918, xiv, 127.

GENITO-URINARY SURGERY

Kidney and Ureter

A case of calculous pyonephrosis. K. BLACK. Indian M. Gaz., 1918, liii, 60. [257]

Pyelotomy in the treatment of renal lithiasis. J. A. PRESNO Y BASTIONY. Rev. de med. y ciruj., Habana, 1918, xxiii, 89.

Recurrence of vesical calculi. MOLLA. Med. Ibera, Madrid, 1918, iii, 198.

Trauma and kidney cancer. LOUMEAU. Gaz. hebd. de sc. méd., Bordeaux, 1918, xxxix, 69.

Hydatid cysts of the kidney. LOUMEAU. J. de méd. de Bordeaux, 1918, lxxxix, 102.

Floating kidney; nephropexy. S. LLOYD. N. Y. St. J. Med., 1918, xviii, 181.

Hæmorrhage secondary to nephrolithotomy. J. FRANK. Surg., Gynec. & Obst., 1918, xxvi, 538.

Renal infections; a clinical and bacteriologic study. H. CULVER, R. D. HERROLD, and F. M. PHIFER. J. Am. Ass., 1918, lxx, 1444. [257]

The radiographic diagnosis of incipient hydronephrosis. M. KROTOSZYNER. West. M. Times, 1918, xxxvii, 448.

Hydronephrosis as an underlying cause in attacks of acute abdominal pain. S. P. MARTIN. N. Y. M. J., 1918, cvii, 834. [257]

Renal tuberculosis. LEGUEU. Rev. gén. de clin. et de thérap., 1918, xxxii, 344.

The present status of renal tuberculosis. R. H. GREEN. Internat. J. Surg., 1918, xxxi, 151.

The management of renal tuberculosis. H. G. BUGBEE. Surg., Gynec. & Obst., 1918, xxvi, 479. [258]

A case of suppurative paranephritis of tonsillar origin. R. BOTTESELLE. Riforma med., Napoli, 1918, xxxiv, 44.

The acute nephritis of war. A. CECONI. Riforma med., Napoli, 1918, xxxiv, 62.

War wounds of the kidney. F. CATHELIN. Bull. méd., Par., 1918, xxxii, 203.

A comparative study of the effects of thorium and other substances on the renal parenchyma when retained. J. E. BURNS and P. B. HOPKINS. J. Urol., 1918, ii, 145.

The presence of spirochetes in the kidney. Y. KON and T. WATABIKI. J. Am. M. Ass., 1918, lxx, 1522.

Pyelitis in the newborn. H. F. HELMHOLZ. Med. Clin. N. Am., 1918, i, 1451.

Specimens of congenital anomalies of the upper urinary tract, with brief reference to embryological factors in their formation and their frequency. D. W. MAC KENZIE. Internat. J. Surg., 1918, xxxi, 145.

Some complications and incorrect diagnoses in urological surgery. O. S. LOWSLEY. N. Y. St. J. Med., 1918, xviii, 184.

A comparison of the functional and anatomic findings in a series of cases of renal disease. A. STENGEL, J. H. AUSTIN, and L. JONAS. Int. Med., 1918, xxi, 313.

Renal function test in children. C. U. MOORE. Northwest Med., 1918, xvii, 78. [259]

Report of a case illustrating the value of kidney drainage with the ureteral catheter, of pelvis lavage and intraureteral manipulation. H. G. BUGBEE. Am. J. Obst., N. Y., 1918, lxxvii, 781.

Ureteral calculus removed by the vaginal route. JUDD. Am. J. Obst., N. Y., 1918, lxxvii, 849.

Renal and ureteral stone. B. TENNEY. Boston M. & S. J., 1918, clxxviii, 731. [259]

Varieties of ureteral strictures. D. N. EISENDRATH. Surg. Clin. Chicago, 1918, ii, 95. [259]

Indigocarmine used intravenously for locating ureteral orifices in tuberculous cystitis. P. MARTIN. Med. Rec., 1918, xciii, 808.

Bladder, Urethra, and Penis

Bladder calculi in infancy. P. BOROBIO. Arch. Espan. de Pediat., 1918, ii, 65. [260]

An unusual case of vesical calculus. P. H. COOK. Interst. M. J., 1918, xxv, 419. [261]

Large vesical calculus dating from infancy. LOUMEAU. Gac. hebd. d. sc. méd., Bordeaux, 1918, xxxix, 53. [261]

Tumors of the bladder and their non-operative treatment. W. F. BRAASCH. Minnesota Med., 1918, i, 168.

War wounds of the bladder. F. CATHELIN. Lyon chirurg., 1918, xv, 109. [261]

Vesical miasis. A. MENDEZ. Rev. de med. y ciruj.. Habana, 1918, xxiii, 185. [262]

Bladder drainage and irrigation. J. MAC MUNN. Lancet, Lond., 1918, cxciv, 672.

Drainage of the bladder for pyelitis and urosepsis under stovaine anæsthesia. H. H. MORTON. Med. Times, 1918, xlvi, 123.

A cystoscopic study of the end-results of various forms of cystocele operations. L. BROUN and R. M. RAWLS. Surg., Gynec. & Obst., 1918, xxvi, 502.

Concerning newer methods of urethrovesical diagnosis as applied to the neck of the bladder and posterior urethra. L. BUERGER. Am. J. Surg., 1918, xxxii, 97.

The proof of cure in gonococcic urethritis. J. PEDERSEN. Internat. J. Surg., 1918, xxxi, 168. [262]

The histopathology of urethral stricture. T. M. TOWNSEND and J. J. VALENTINE. Internat. J. Surg., 1918, xxxi, 154.

Pelvic fracture and total rupture of urethra. PIERI. Presse méd., Par., 1918, xxv, Supp. 368.

Genital Organs

Impotency, its treatment by transplantation of testicle. V. D. LESPINASSE. Surg. Clin. Chicago, 1918, ii, 281. [262]

The developmental stage of the human seminal vesicles. E. M. WATSON. J. Urol., 1918, ii, 129.

An instructive case of prostatic adenomata with vesical calculus concealed by a sessile pedunculated median lobe. G. F. LYDSTON. J. Am. M. Ass., 1918, lxx, 1297.

Prostatic cysts. E. CASTANO. Rev. Asoc. méd. argent., Buenos Aires, 1918, xxviii, 317.

True senile prostate associated with multiple sacculi of the bladder. G. F. LYDSTON. Illinois M. J., 1918, xxxiii, 250.

Clinical notes on 5 more cases of transvesical prostatectomy. C. NEGRETE. Rev. Ibero-Am. de cien. méd., Madrid, 1918, xxxix, 299.

Perineal prostatectomy. P. SYMS. Internat. J. Surg., 1918, xxxi, 165.

Anatomic results after prostatectomy. A. HYMAN. Internat. J. Surg., 1918, xxxi, 158. [263]

End-results in the prostatectomized patient; a comparative analysis, based on 110 cases. C. MARTIN. J. Am. M. Ass., 1918, lxx, 1287. [263]

Miscellaneous

Radiography in the diagnosis of urinary deseases. E. AIEVOLI. Riforma med., Napoli, 1918, xxxiv, 108.

Different operations in urinary lithiasis. UTEAU. Progrès méd., Par., 1918, p. 189.

Difficulty in micturition. A. L. WOLBARST. Internat. J. Surg., 1918, xxxi, 161.

War wounds of the genito-urinary organs. A. CHALIER and R. GLÉNARD. Rev. de chir., Par., 1917, liii, 552. [264]

Urinary antisepsis; further studies of the antiseptic properties and the renal excretion of compounds related to phenolsulphonephthalein. E. G. DAVIS and E. C. WHITE. J. Urol., 1918, ii, 107.

The cystoscope an essential in genito-urinary surgery. C. BEGG. Canad. Pract. & Rev., 1918, xliii, 145.

Presentation of case history to the Los Angeles Clinical and Pathological Society. G. MACGOWAN. J. Urol., 1918, ii, 141.

The genito-urinary clinic. N. P. RATHBUN. N. Y. M. J., 1918, cvii, 774.

SURGERY OF THE EYE AND EAR

Eye

Foreign bodies in the eye. H. W. CHAMPLIN. J. Am. Inst. Homœop., 1918, x, 1405.

Removal of foreign bodies from the eyeball and orbital cavity; report of cases. D. ROY. South. M. J., 1918, xi, 386. [265]

Cataract. E. V. SRINIVASACHARY. Madras M. J., 1918, i, 81.

New data concerning formation of cataract. A. M. CALDERIN. Prog. de la Clin., Madrid, 1917, v, Supp. 202.

Some points in the operative technique and after-treatment of senile cataract extraction. W. W. HOARE. Med. J. Austral., 1918, i, 297. [265]

Some remarks concerning the Smith-Indian intraocular operation for cataract. F. ALLPORT. N. Y. M. J., 1918, cvii, 924.

Differential diagnosis and treatment of follicular conjunctivitis. W. M. D. CARHART. Med. Rec., 1918, xciii, 540. [265]

Report of a case of cicatricial ectropion corrected by plastic operation. G. SLOCUM. J. Mich. St. M. Soc., 1918, xvii, 189.

A case of neuroparalytic keratitis. SORIA. Siglo méd., Madrid, 1918, lxv, 338.

Blepharospasm secondary to pyorrhœa alveolaris. H. M. THOMPSON. Am. J. Ophth., 1918, i, 338.

Corneal loupe. R. VON DER HEYDT. Am. J. Ophth., 1918, i, 339.

A new canthoplasty for trachomatous conditions. J. S. WYLER. Ohio. St. M. J., 1918, xiv, 218.

Total symplepharon; cavitary repair by epidermic grafts. V. MORAX. Ann. d'ocult., Par., 1918, clv, 223.

Hysterical amblyopia. F. A. MORRISON. Am. J. Ophth., 1918, i, 338.

Treatment of the eye with ductless gland products. S. B. MUNCASTER. Wash. M. Ann., 1918, xvii, 187.

The vestibular apparatus and its relation to aviation. W. R. MURRAY. J.-Lancet, 1918, xxxviii, 155. [265]

Posterior eccentric enucleation of the ocular globe. R. PARDO. Gazz. d. osp.e d. clin., Milano, 1918, xxxix, 125.

Association of ocular and nasal accessory sinus disease. G. O. RING. Am. J. Ophth., 1918, i, 324.

Ocular tuberculosis. L. D. BROSE. J. Indiana St. M. Ass., 1918, xi, 113. [266]

Wassermann findings in ophthalmic disease. N. M. BRINKERHOFF. Am. J. Ophth., 1918, i, 322.

The nervous manifestations of syphilis of the eye. J. COLLINS. Am. J. M. Sc., 1918, clv, 649.

Primary syphilis of the eyelid, with report of a case. H. D. LLOYD. Boston M. & S. J., 1918, clxxviii, 609.

Star-shaped figure in macula of syphilitic origin. H. C. HADEN. Am. J. Ophth., 1918, i, 313.

Report of some interesting ophthalmologic cases. C. LOEB. Illinois M. J., 1918, xxxiii, 257.

The light pupillary reflex, its path, and its abolition called immobility of the pupil to the right reflex, and report of a case of unilateral Argyll-Robertson pupil, in which consensual reaction existed in both eyes. A. LUTZ. Arch. Ophth., 1918, xlvii, 266.

An introduction to neurological ophthalmology, prepared for the New York Neurosurgical School for Army Medical Officers. W. A. HOLDEN. Arch. Ophth., 1918, xlvii, 221.

Cases of hæmangioma of the palpebral conjunctiva forming pedunculated tumors. R. JAMES and R. S. TREVOR. Brit. J. Ophth., 1918, ii, 129.

Avulsion of the eyeball in birth. J. H. JOYCE. Brit. M. J., 1918, i, 590.

Diseases of the eyes in Cuba. J. S. FERNANDEZ. N. Orl. M. & S. J., 1918, lxx, 717. **[266]**

Two cases of atrophy of iris. F. ALLPORT and J. R. SMITH. Am. J. Ophth., 1918, i, 336.

A case of leucosarcoma of the iris, treated by radium. S. GIFFORD. Arch. Ophth., 1918, xlvii, 241.

A study of images reflected from the cornea, iris, lens, and sclera. W. H. BATES. N. Y. M. J., 1918, cvii, 916.

The treatment of pneumococcus ulcer of the cornea with the thermophore. J. GREEN, JR. South. M. J., 1918, xi, 251. **[266]**

A pathogenic bacillus subtilis isolated from the eye. E. A. GREENSPON. Am. J. Ophth., 1918, i, 316.

The narrowing of the pupil does not lower normal intra-ocular tension. A. M. CARR. Arch. Ophth., 1918, xlvii, 177. **[266]**

A case of bilateral congenital blepharoptosis successfully operated by the Motais method. B. CARRERAS. Siglo méd., Madrid, 1918, lxv, 258.

Myopia and myopic astigmatism in relation to the glare of Mesopotamia. P. G. DOYNE. Brit. M. J., 1918, i, 563.

Focal infections of the eye from the intestinal tract. J. G. DWYER. Arch. Ophth., 1918, xlvii, 261.

Detailed technique of extirpation of the lachrymal sac. S. BASTERRA. Prog. de la Clin., Madrid, 1917, v, 277.

A case of traumatic pulsating exophthalmos. A. J. BEDELL. Am. J. Ophth., 1918, i, 311.

The eye in industrial accidents. N. M. BLACK. Wisconsin. M. J., 1918, xvi, 435.

Unilateral Argyll-Robertson sign by intra-orbital shell fragment. J. BOLLACK. Arch. d'opht., Par., 1918, xxxvi, 106.

Respecting eye muscle advancement. E. LANDOLT. Arch. d'opht., Par., 1918, xxxvi, 65.

Conservative eye operations. A. POULARD. Ann. d'ocult., Par., 1918, clv, 233.

Ear

The conservation of hearing. H. NEWHART. Minnesota Med., 1918, i, 161.

The function and apparatus of equilibration. B. A. RANDALL. Penn. M. J., 1918, xxi, 491.

Carcinoma of the external ear with the report of a case. F. WARNER. Ann. Otol., Rhinol., & Laryngol., 1917, xxvi, 950.

Value of routine examination of the labyrinth. I. H. JONES. N. Y. St. J. Med., 1918, xviii, 167.

The static labyrinth. G. W. STIMSON. N. Y. M. J., 1918, cvii, 539. **[267]**

Mastoiditis. W. H. HUNTINGTON. Med. Rec., 1918, xciii, 849. **[267]**

Some rare complications of acute mastoiditis with unusual symptoms. W. T. PATTON. South. M. J., 1918, xi, 381.

Rapid recovery from mastoid trepanations by the Carrel method. G. MAHU. Bull. Acad. de méd., Par., 1918, lxxix, 309.

Ionic medication in middle ear catarrh. A. A. PIM. Practitioner, Lond., 1918, c, 440.

Tubercular mastoiditis; radical operation under cocaine anæsthesia. H. HAYS. Ann. Otol., Rhinol. & Laryngol., 1918, xxvi, 938. **[268]**

Reports of mastoid cases from an X-ray standpoint. G. S. DIXON. Ann. Otol., Rhinol. & Laryngol., 1918, xxvi, 986.

Clinical observations on subacute mastoiditis. H. B. BLACKWELL. Ann. Otol., Rhinol., & Laryngol., 1917, xxvi, 998.

Syphilis of the inner ear and eighth nerve. G. W. MAC KENZIE. Am. J. Syph., 1918, ii, 241. **[268]**

Factors in the causation of tinnitus aurium. J. L. MAYBAUM. N. Y. M. J., 1918, cvii, 780. **[268]**

Double otitis media; submiliary pulmonary tuberculosis. E. AMBERG. Ann. Otol., Rhinol. & Laryngol., 1917, xxvi, 933.

Etiology and symptomatology of chronic suppurative otitis. A. B. BAER. Calif. St. J. Med., 1918, xvi, 253.

The thyroid from the standpoint of an otolaryngologist. J. C. BECK. Mississippi Valley M. J., 1918, xxv, 135.

SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

Report of interesting nasal cases due to syphilis; remarks on obscure syphilitic nasal symptoms. D. ROY. Ann. Otol., Rhinol., & Laryngol., 1917, xxvi, 967.

Cough as a reflex manifestation in ear, nose, and facial affections. W. F. A. SCHULTZ. Med. Fortnightly, 1918, l, 105.

Pituitary tumors from the surgical standpoint of the rhinologist. O. J. STEIN. N. Y. M. J., 1918, cvii, 585. **[269]**

Sarcoma of the ethmoid. A. V. MOSCHCOWITZ. Ann. Surg., Phila., 1918, lxvii, 621.

Ozena and asphyxiating gas; a new etiological standpoint. M. NATIER. Ann. Otol., Rhinol., & Laryngol., 1917, xxvi, 942.

The intranasal operation for the relief of chronic dacryocystitis, with some deductions from twenty cases. C. F. BOOKWALTER. Ann. Otol., Rhinol., & Laryngol., 1918, xxvi, 982.

Teratoma of nasal cavity in a child of two months. U. BOSCH. Arch. de ginec., obst. y pediat., Barcelona, 1918, xxxi, 51.

Throat

Hoarseness; its relation to local and general diseases. J. H. McCREADY. Penn. M. J., 1918, xxi, 523.

The range of the physiological life of the tonsil. J. W. SMITH. Illinois M. J., 1918, xxxiii, 268.

Bone metaplasia in the tonsil. H. ALBERT and M. G. DOUGLAS. Ann. Otol., Rhinol., & Laryngol., 1917, xxvi, 909.

Why are the tonsils and lymphatics of the nose and throat responsible for so many systemic diseases? R. H. GOOD. Illinois M. J., 1918, xxxiii, 271.

Tonsillectomy in diphtheria carriers. P. FIGDOR. Brit. M. J., 1918, i, 577.

Abscess of the lung following operation on the tonsils and upper air tract. C. W. RICHARDSON. Ann, Otol., Rhinol. & Laryngol., 1917, xxvi, 961.

Cartilaginous tumors of the larynx. G. B. NEW. Laryngoscope, 1918, xxviii, 367.

The ignored forms of laryngeal tuberculosis. D. TANTURRI. Riforma med., Napoli, 1918, xxxiv, 4.

Treatment of laryngeal tuberculosis. J. DWORETZKY. Long Island M. J., 1918, xii, 161.

Treatment of laryngeal cancer by radium intubation. R. BOTEY. Rev. de med. y cirug. práct., Madrid, 1918, cxviii, 289.

Further report on the treatment of malignant disease of the larynx; management and statistics of malignant disease of the respiratory tract. J. C. BECK. Laryngoscope, 1918, xxviii, 131. [269]

Mouth

Radium in the treatment of carcinoma of the buccal cavity. R. B. GREENOUGH. Boston M. & S. J., 1918, clxxviii, 598.

Some principles involved in the treatment of mandibular fractures. C. H. BUBB. Proc. Roy. Soc. Med., 1918, xi, Sect. Odontol., 27.

The operative treatment of ununited fractures of the mandible. P. P. COLE. Proc. Roy. Soc. Med., 1918, xi, Sect. Odontol., 38.

Restoration of abnormal mouths by surgical treatment before inserting plates. J. P. RUYL. Dental Cosmos, 1918, lx, 414.

Repair operations applicable to palatal mutilations. H. MORESTIN. Bull. Acad. de méd., Par., 1918, lxxix, 303.

Vincent's angina from the oral surgical standpoint. H. A. HAINES. Dental Cosmos, 1918, lx, 295. [270]

Anatomy of the teeth and jaws; special reference to roentgenogram interpretation. R. H. IVY. Internat. J. Orthodontia, 1918, iv, 124. [270]

Dentigerous cysts, with report of a case. I. FRANK. Ann. Otol., Rhinol. & Laryngol., 1917, xxvi, 991.

The teeth as a causal factor in nasal, ocular and aural diseases. H. S. WEAVER. J. Am. Inst. Homœop., 1918, x, 1410.